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THE COMPLETE LINE

UNITED STATES RADIATOR CORPORATION

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UNITED STATES HAND BOOK

United States Radiator Corporation

GENERAL OFFICES, DETROIT, MICH.

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FOREWORD

ON July 1, 1910, the organization of the UNITED STATES RADIATOR CORPORATION was consummated by the purchase of the following concerns:

The UNITED STATES RADIATOR COMPANY, of Dunkirk, N. Y., manufacturers of Triton Radiation.

The UNITED STATES HEATER COMPANY, of Detroit, Mich., manufacturers of Capitol Boilers and Puritan and Florentine Radiation.

The UNITED STATES RADIATOR AND BOILER COMPANY, of Pittsburgh, Pa., manufacturers of Sun Boilers and Sun Radiation.

The HERENDEEN MANUFACTURING COMPANY, of Geneva, N. Y., manufacturers of Furman Boilers.

The HEATING DEPARTMENT of the J. L. MOTT IRON WORKS, distributors of Sunray Boilers and Grecian Radiation.

Since that time the UNITED STATES RADIATOR CORPORATION has acquired:

The SODEMANN RADIATOR COMPANY, of St. Louis, Mo., with factory at Edwardsville, Ill.

The CENTRAL RADIATOR COMPANY, of Paola, Kan.

The SMITH & THAYER COMPANY, of Boston, Mass., and New York, N. Y., distributors of Winchester Boilers.

The concentration into a single organization of all the ability, the experience and the broad knowledge of the independent companies, in the manufacture and sale of boilers, radiators and supplies, is a reasonable assurance that the high standard of the past will be steadily advanced in the future. The personnel of the individual companies has, to a large extent, been kept intact. The same men

who have merited the confidence of the heating contractor, the architect and the engineer in the past, are now exerting their united efforts in their enlarged opportunities for serving.

Through its seven plants and several branch warehouses well distributed geographically, The United States Radiator Corporation brings to you "The Complete Line" with dispatch in shipment and deliveries, and through its many branch offices and large selling organization offers you that intimate and personal relationship, which is so essential to satisfactory service in business dealings.

We therefore invite inspection and frequent use of this, our first catalogue, and trust you will permit us to fill your heating requirements from "The Complete Line," with full knowledge that your orders, large or small, will receive the same careful and prompt attention.

Most sincerely yours

THE UNITED STATES RADIATOR CORPORATION

PRICES AND RATINGS LISTED HEREIN SUPERSEDE ALL FORMER LISTS AND ARE SUBJECT TO CHANGE WITHOUT NOTICE

PRICE QUOTATIONS MADE TO THE REGULAR TRADE ONLY

RATINGS

THE ratings of steam boilers are based on the radiation being sufficient to heat the building to the required temperature, with not to exceed two pounds pressure at the boiler.

The ratings of water boilers are based on a standard water temperature of 180 degrees as it leaves the boiler.

Our ratings are for direct cast-iron radiation. Indirect radiation adds 50 per cent to the drain on the boiler, that is, 1000 feet of indirect radiation is equivalent to 1500 feet of direct.

All boilers should be covered with asbestos plastic cement to an average thickness of at least 1½ inches. When boilers are not so covered the number of square feet of exposed heating surface on them (which can be easily determined from published outside dimensions) should be increased by 75 per cent to obtain the equivalent of cast-iron radiating surface. This additional surface should be included in the total drain upon boiler capacity.

All ratings provide that in estimating the size of boiler required (all piping, mains and risers—flow and return) should be figured as radiating surface, in addition to the cast-iron radiating surface to be used.

When a pipe coil is used as a radiator, add 25 per cent to the total number of square feet of surface to obtain the equivalent of cast-iron radiation.

If the piping in the basement is left uncovered, the equivalent number of square feet of cast-iron radiating surface it contains should be increased by 50 per cent in computing the size of boiler required.

When the piping is covered, the loss is somewhat lessened, depending upon the quality and thickness of the covering. While covering results in fuel economy and

RATINGS—*Continued*

decrease of heat loss, it is not sufficient to materially influence the required boiler capacity.

When a pipe coil or cast-iron section is introduced into the fire-pot or a steam coil placed in a tank for the purpose of heating water for domestic use, additional capacity should be provided, in estimating size of boiler required, at the rate of 1¼ square feet of direct radiation for steam boiler and 2 square feet for water boiler for each gallon of water to be thus heated per hour.

For economic results we do not recommend the use of a coil in fire-pot for heating water, but advise the use of a separate Water Heater.

GUARANTEES

We absolutely guarantee the published ratings of our boilers, provided the radiation in each case is ample for the requirements of the building, the piping of sufficient size and properly run, the boiler connected to a flue of ample capacity and good draft (see pages 214 to 216) a suitable grade of fuel used, and the apparatus operated in accordance with our printed instructions.

This guarantee does not apply when only a portion of a building is to be heated, nor when the radiation installed is insufficient to heat the building to 70 degrees in zero weather and is based on the use of hard coal only for fuel. A larger boiler should be used for soft coal or wood.

CAPITOL IMPROVED SECTIONAL STEAM BOILERS—25 Series

Number	*Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
1425	450	$271.00	32	25 x 19	29 x 30	2–4	12
425	525	298.00	32	25 x 19	29 x 30	2–4	12
1525	625	360.00	38½	25 x 25½	29 x 37	2–4	12
525	700	388.00	38½	25 x 25½	29 x 37	2–4	12
1625	800	425.00	45	25 x 32	29 x 43	2–4	12
625	875	453.00	45	25 x 32	29 x 43	2–4	12
1725	975	491.00	51½	25 x 38½	29 x 50	2–4	12
725	1050	519.00	51½	25 x 38½	29 x 50	2–4	12
1825	1150	556.00	58	25 x 45	29 x 56	2–4	12
825	1225	584.00	58	25 x 45	29 x 56	2–4	12

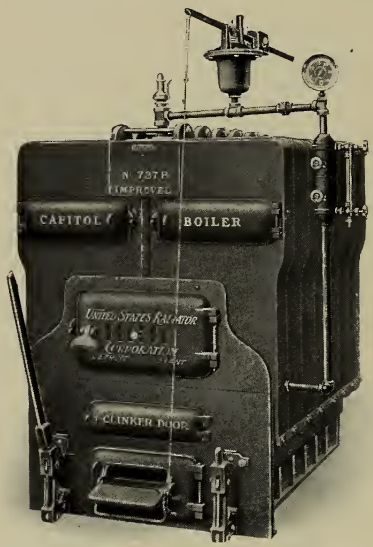
Height of outlet . . 50 inches. Height of water line . . 43 inches.
Width of boiler including trimmings . . . . . 40½ inches.
Deduct for smoke hood, 6 inches.
For additional measurements, see pages 14 and 15.
See trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 174 to 182.
* **See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

CAPITOL IMPROVED SECTIONAL WATER BOILERS—25 Series

Number	* Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
1425	750	$259.00	32	25 x 19	29 x 30	2–4	12
425	875	286.00	32	25 x 19	29 x 30	2–4	12
1525	1025	347.00	38½	25 x 25½	29 x 37	2–4	12
525	1150	375.00	38½	25 x 25½	29 x 37	2–4	12
1625	1325	413.00	45	25 x 32	29 x 43	2–4	12
625	1450	440.00	45	25 x 32	29 x 43	2–4	12
1725	1600	478.00	51½	25 x 38½	29 x 50	2–4	12
725	1725	505.00	51½	25 x 38½	29 x 50	2–4	12
1825	1900	544.00	58	25 x 45	29 x 56	2–4	12
825	2025	569.00	58	25 x 45	29 x 56	2–4	12

Height of outlets . . . . . 47½ inches.
Width of boiler, including trimmings . . . . . 30½ inches.
Deduct for smoke hood, 6 inches.
For additional measurements, see pages 14 and 15.
See trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 174 to 182.
An additional charge will be made for bushings, extra tappings, crating and name plates.
*** See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

CAPITOL IMPROVED SECTIONAL STEAM BOILERS—37 Series



Number	* Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Tappings		Smoke Pipe Inches
						Flow Inches	Return Inches	
1537 B	1350	$631.00	43	37 x 30	40 x 42	2–4	2–4	16
537 B	1500	687.00	43	37 x 30	40 x 42	2–4	2–4	16
1637 B	1700	762.00	50½	37 x 37½	40 x 50	2–4	2–4	16
637 B	1925	847.00	50½	37 x 37½	40 x 50	2–4	2–4	16
1737 B	2150	929.00	58	37 x 45	40 x 57	3–4	2–4	16
737 B	2375	1004.00	58	37 x 45	40 x 57	3–4	2–4	16
1837 B	2600	1073.00	65½	37 x 52½	40 x 64	3–4	2–4	16
837 B	2825	1136.00	65½	37 x 52½	40 x 64	3–4	2–4	16
1937 B	3075	1199.00	73	37 x 60	40 x 72	4–4	2–4	16
937 B	3325	1261.00	73	37 x 60	40 x 72	4–4	2–4	16
2037 B	3575	1324.00	80½	37 x 67½	40 x 80	4–4	2–4	16
1037 B	3825	1386.00	80½	37 x 67½	40 x 80	4–4	2–4	16

Height of outlets . . 57½ inches. Height of water line . . 50 inches.
Width of boiler, including trimmings . . . . . 55 inches.
Deduct for smoke hood, 7¼ inches.
For additional measurements, see pages 14 and 15.
See trimmings, grates, etc., page 44.
For price list of repairs, see pages 174 to 182.
*** See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

CAPITOL IMPROVED SECTIONAL WATER BOILERS—37 Series

Number	*Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Tappings		Smoke Pipe Inches
						Flow Inches	Return Inches	
1537 B	2225	$619.00	43	37 x 30	40 x 42	2–4	2–4	16
537 B	2475	675.00	43	37 x 30	40 x 42	2–4	2–4	16
1637 B	2800	750.00	50½	37 x 37½	40 x 50	2–4	2–4	16
637 B	3175	831.00	50½	30 x 37½	40 x 50	2–4	2–4	16
1737 B	3550	904.00	58	37 x 45	40 x 57	3–4	2–4	16
737 B	3925	982.00	58	37 x 45	40 x 57	3–4	2–4	16
1837 B	4300	1049.00	65½	37 x 52½	40 x 64	3–4	4–4	16
837 B	4650	1109.00	65½	37 x 52½	40 x 64	3–4	4–4	16
1937 B	5075	1173.00	73	37 x 60	40 x 72	4–4	4–4	16
937 B	5500	1238.00	73	37 x 60	40 x 72	4–4	4–4	16
2037 B	5900	1298.00	80½	37 x 67½	40 x 80	4–4	4–4	16
1037 B	6300	1359.00	80½	37 x 67½	40 x 80	4-4	4–4	16

Height of outlets . . . . . 57½ inches.
Width of boiler, including trimmings . . . . . 45 inches.
Deduct for smoke hood, 7¼ inches.
For additional measurements, see pages 14 and 15.
See trimmings, grates, etc., page 44.
For price list of boiler repairs, see pages 174 to 182.
***See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

CAPITOL IMPROVED SECTIONAL STEAM BOILERS—48 Series

Number	*Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Tappings Outlets Inches	Tappings Inlets Inches	Smoke Pipe Inches
1748 B	3550	$1318.00	66½	48 x 50½	4–4	4–4	18
748 B	3875	1399.00	66½	48 x 50½	4–4	4–4	18
1848 B	4250	1493.00	75	48 x 59		4–4	18
848 B	4575	1574.00	75	48 x 59		4–4	18
1948 B	5000	1680.00	83½	48 x 67½		4–4	18
948 B	5325	1761.00	83½	48 x 67½	2–4 and 2–6	4–4	18
2048 B	5750	1868.00	92	48 x 76		4–4	20
1048 B	6075	1949.00	92	48 x 76		4–4	20
2148 B	6500	2055.00	100½	48 x 84½		4–4	20
1148 B	6850	2143.00	100½	48 x 84½		4–4	20
2248 B	7250	2243.00	109	48 x 93		4–4	21
1248 B	7650	2342.00	109	48 x 93	4–6	4–4	21
2348 B	8100	2455.00	117½	48 x 101½		4–4	21
1348 B	8550	2568.00	117½	48 x 101½		4–4	21

Height of outlets . . 67½ inches. Height of water line . . 59 inches.
Width of boiler, including trimmings . . . . . 67½ inches.
Deduct for smoke hood, 7½ inches.
For additional measurements, see pages 14 and 15.
See trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 174 to 182.
***See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

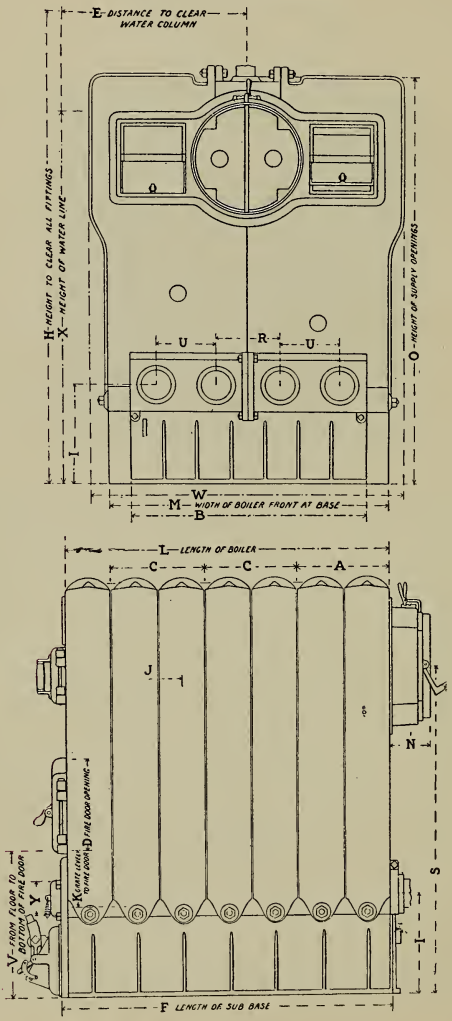
CAPITOL IMPROVED SECTIONAL WATER BOILERS—48 Series

Number	*Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Tappings Outlets Inches	Tappings Inlets Inches	Smoke Pipe Inches
1748 B	5850	$1290.00	66½	48 x 50½	4–4	4–4	18
748 B	6400	1373.00	66½	48 x 50½	4–4	4–4	18
1848 B	7000	1466.00	75	48 x 59		4–4	18
848 B	7550	1548.00	75	48 x 59		4–4	18
1948 B	8250	1655.00	83½	48 x 67½	2–4 and 2–6	4–4	18
948 B	8775	1734.00	83½	48 x 67½		4–4	18
2048 B	9475	1840.00	92	48 x 76		4–4	20
1048 B	10025	1923.00	92	48 x 76		4–4	20
2148 B	10725	2030.00	100½	48 x 84½		4–4	20
1148 B	11300	2118.00	100½	48 x 84½		4–4	20
2248 B	11950	2216.00	109	48 x 93	4–6	4–4	21
1248 B	12625	2317.00	109	48 x 93		4–4	21
2348 B	13375	2430.00	117½	48 x 101½		4–4	21
1348 B	14100	2541.00	117½	48 x 101½		4–4	21

Height of outlets . . . . . 67½ inches.
Width of boilers, including trimmings . . . . . 57½ inches.
Deduct for smoke hood, 7½ inches.
For additional measurements, see pages 14 and 15.
See trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 174 to 182.
***See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

CAPITOL IMPROVED SECTIONAL BOILERS—25-37-48 Series

MEASUREMENTS



CAPITOL IMPROVED SECTIONAL BOILERS

MEASUREMENTS

Figure	25 Series Water and Steam	37 Series Water and Steam	48 Series Water and Steam
H	64½ (s)	75 (s)	83 (s)
E	25½ (s)	33 (s)	38 (s)
W	30½	44½	57½
M	29½	39¾	52
L	425–23½" Add 6½" for each additional section.	537–36½" Add 7½" for each additional section.	648–50½" Add 8½" for each additional section.
F	425–25½" Add 6½" for each additional section.	537–37½" Add 7½" for each additional section.	648–51" Add 8½" for each additional section.
C	425– 725 } 13" 1425–1725 } 825–1825 26"	537– 637 } 15" 1537–1637 } 737– 837 } 15"–15" 1737–1837 } 937–1037 } 15"–15" 1937–2037 } –15"	648– 748 } 17"–8½" 1748 } –17" 848–1348 } 17"–17" 1848–2348 } –17"
J	6½	7½	8½
N	6	7¼	7½
B	24½	35½	45¾
O	47½ (w) 50 (s)	57½	67½
A	5¼	7	8"– 648–1948 17"–1048–2348
I	13¼	13¼	13⅞
R	$16\frac{5}{16}$	$27\frac{3}{16}$	$14\frac{1}{16}$
U	. . .	. . .	11½
K	9	11	12
S	39¼	42	52¾
D	10 x 16¾	11 x 21	2–13 x 16
V	21½	22	24
Y	3½ x 14¼	3½ x 14¼	2–3¾ x 11
X	43	50	59

For detailed drawings, see opposite page.
Extra tappings can be supplied at an additional charge.
Special foundations, page 217.
On steam boilers connect all supply tappings full size to main.
Amount of asbestos cement to cover, pages 221 and 222.

FURMAN SECTIONAL STEAM BOILERS
180–220 Series

Number	* Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
184	400	$210.00	38	20 x 17½	30 x 25	2–3	10
185	550	245.00	45	20 x 24	30 x 31	2–3	10
186	700	310.00	51	20 x 30	30 x 37	2–3	10
187	850	355.00	57	20 x 36	30 x 43	2–3	10
225	800	340.00	47	27 x 23	34 x 31	2–3	12
226	1000	400.00	53	27 x 29	34 x 37	2–3	12
227	1200	460.00	59	27 x 35	34 x 43	2–3	12
228	1400	520.00	66	27 x 42	34 x 50	3–3	12

	180 Series	220 Series
Height of outlets	48 inches.	53 inches.
Width of boiler, including trimmings	28½ inches.	38 inches.
Height of water line	40½ inches.	43½ inches.
Deduct for smoke hood	12 inches.	14 inches.

For additional measurements, see pages 22 and 23.
See trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 174 to 182.
An additional charge will be made for bushings, extra tappings, crating and name plates.
* **See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

FURMAN SECTIONAL WATER BOILERS

180–220 Series

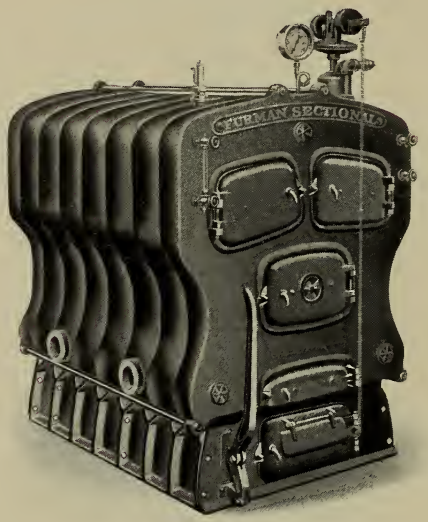
Number	*Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
184	650	$200.00	38	20 x 17½	30 x 25	2–3	10
185	910	235.00	45	20 x 24	30 x 31	2–3	10
186	1170	300.00	51	20 x 30	30 x 37	2–3	10
187	1430	345.00	57	20 x 36	30 x 43	2–3	10
225	1320	330.00	47	27 x 23	34 x 31	2–3	12
226	1650	390.00	53	27 x 29	34 x 37	2–3	12
227	1980	450.00	59	27 x 35	34 x 43	2–3	12
228	2310	510.00	66	27 x 42	34 x 50	3–3	12

	180 Series	220 Series
Height of outlets	48 inches.	53 inches.
Width of boiler	28½ inches.	38 inches.
Deduct for smoke hood	12 inches.	14 inches.

For additional measurements, see pages 22 and 23.
See trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 174 to 182.
An additional charge will be made for bushings, extra tappings, crating and name plates.
* **See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

FURMAN SECTIONAL STEAM BOILERS

270–330 Series



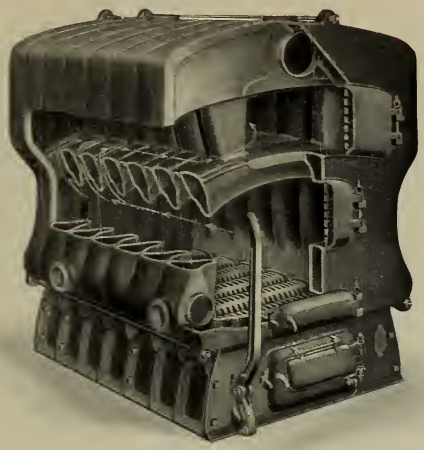
Number	* Rating Square Inches	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
276	1350	$510.00	55	32 x 31	41 x 40	2–4	14
277	1650	600.00	62	32 x 38	41 x 47	2–4	14
278	1950	690.00	68	32 x 45	41 x 54	3–4	14
279	2250	780.00	75	32 x 51	41 x 60	3–4	14
337	2300	785.00	67	38 x 40	47 x 51	2–4	16
338	2700	875.00	74	38 x 48	47 x 58	3–4	16
339	3100	965.00	81	38 x 55	47 x 65	3–4	16
340	3500	1055.00	88	38 x 62	47 x 72	3–4	16

	270 Series	330 Series
Height of outlets	56 inches.	62 inches.
Width of boiler, including trimmings	42½ inches.	50 inches.
Height to water line	45½ inches.	49 inches.
Deduct for smoke hood	16 inches.	18 inches.

For additional measurements, see pages 22 and 23.
See trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 174 to 182.
An additional charge will be made for bushings, extra tappings, crating and name plates.
* **See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

FURMAN SECTIONAL WATER BOILERS

270–330 Series



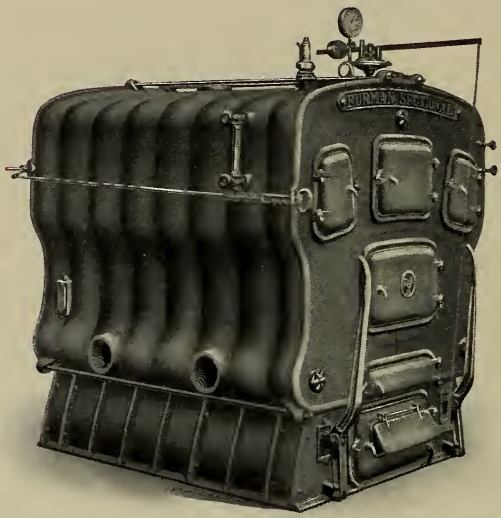
Number	* Rating Square Inches	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
276	2230	$500.00	55	32 x 31	41 x 40	2–4	14
277	2720	590.00	62	32 x 38	41 x 47	2–4	14
278	3210	680.00	68	32 x 45	41 x 54	3–4	14
279	3700	770.00	75	32 x 51	41 x 60	3–4	14
337	3800	775.00	67	38 x 40	47 x 51	2–4	16
338	4450	865.00	74	38 x 48	47 x 58	3–4	16
339	5100	955.00	81	38 x 55	47 x 65	3–4	16
340	5750	1045.00	88	38 x 62	47 x 72	3–4	16

	270 Series	330 Series
Height of outlets	56 inches.	62 inches.
Width of boiler	42½ inches.	50 inches.
Deduct for smoke hood	16 inches.	18 inches.

For additional measurements, see pages 22 and 23.
See trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 174 to 182.
An additional charge will be made for bushings, extra tappings, crating and name plates.
* **See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

FURMAN SECTIONAL STEAM BOILERS

380 Series



Number	* Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
387	3250	$982.00	75	44 x 47	60 x 60	2–5	18
388	3800	1095.00	83	44 x 55	60 x 68	3–5	18
389	4350	1208.00	91	44 x 64	60 x 76	3–5	18
390	4900	1321.00	98	44 x 72	60 x 85	4–5	18
391	5450	1434.00	106	44 x 80	60 x 93	4–5	18

Height of outlets . . 69 inches. Height of water line . . 56 inches.

Width of boiler, including trimmings . . . . . 66 inches.

Deduct for smoke hood, 20 inches.

For additional measurements, see pages 22 and 23.

See trimmings, grates, etc., page 44.

For price list of boiler parts, see pages 174 to 182.

An additional charge will be made for bushings, extra tappings, crating and name plates.

***See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.

Use a larger boiler for soft coal.

FURMAN SECTIONAL WATER BOILERS

380 Series

Number	* Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
387	5400	$960.00	75	44 x 47	60 x 60	2–5	18
388	6300	1074.00	83	44 x 55	60 x 68	3–5	18
389	7200	1188.00	91	44 x 64	60 x 76	3–5	18
390	8100	1302.00	98	44 x 72	60 x 85	4–5	18
391	9000	1416.00	106	44 x 80	60 x 93	4–5	18

Height of outlets . . . . . 69 inches.
Width of boiler, including trimmings . . . . . 60 inches.

Deduct for smoke hood, 20 inches.

For additional measurements, see pages 22 and 23.

See trimmings, grates, etc., page 44.

For price list of boiler parts, see pages 174 to 182.

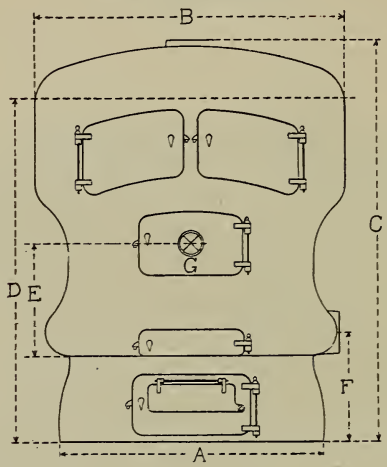
An additional charge will be made for bushings, extra tappings, crating and name plates.

*See Ratings and Guarantee, pages 6 and 7. Telegraph code, pages 223 to 236.

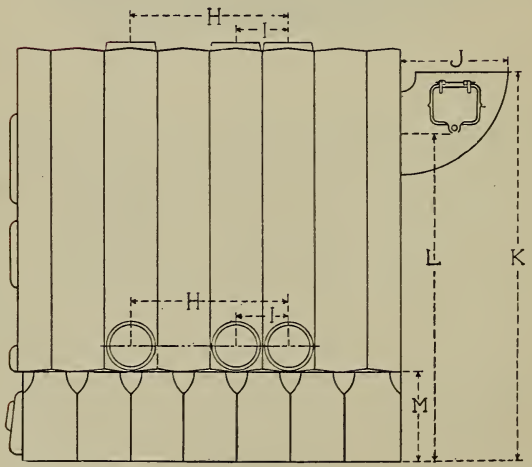
Use a larger boiler for soft coal.

FURMAN SECTIONAL BOILERS

MEASUREMENTS



FRONT VIEW



SECTIONAL VIEW

For detailed measurements, see opposite page.

FURMAN SECTIONAL BOILERS

MEASUREMENTS

	180 Series Inches	220 Series Inches	270 Series Inches	330 Series Inches	380 Series Inches
A	25½	30	36	42	54
B	28½	38	42½	50	60
C	48	53	56	62	69
D	40½	43½	45½	49	56
E	14½	14¾	16	18	19
F	14¾	14¾	16	16	19¾
G	7½ x 11½	8 x 13	9 x 14	11 x 16	12 x 21
H	18¾	18¾	20¼	21¾	24¾
I	6¼	6¼	6¾	7¼	8¼
J	12	14	16	18	20
K	44½	48	50	52	62¾
L	37	39	41½	44	52
M	11½	11½	12	12	15

For detailed drawings, see opposite page.
Extra tappings can be supplied at an additional charge.
Special foundations, page 217.
On steam boilers connect all supply tappings full size to main.
Amount of asbestos cement to cover, pages 221 and 222.

BAFFLE PLATES

IN Furman Sectional Boilers the spaces where fire passes into upper side flue-ways have strips along the sides of openings. Under ordinary conditions these spaces are of proper size, but special Baffle Plates are furnished which, when dropped in these openings, baffle the burning gases to rear of boiler, making a longer fire travel and keeping the fire under better control. In case of a poor draft or a poor grade of coal, the plates may be removed and the thin strips clipped from openings.

SUNRAY SECTIONAL STEAM BOILERS

50 E Series

Number	* Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
54 E	450	$215.00	42	20 x 20	33 x 32	1–3	8
55 E	600	260.00	48	20 x 26	33 x 38	2–3	8
56 E	750	325.00	54	20 x 32	33 x 45	2–3	10
57 E	900	370.00	60	20 x 38	33 x 51	2–3	10

Height of outlet . . 52 inches. Height of water line . . 44 inches.

Width of boiler, including trimmings . . . . . 34 inches.

Deduct for smoke hood, 12 inches.

For additional measurements, see pages 34 and 35.

See trimmings, grates, etc., page 44.

For price list of boiler parts, see pages 174 to 182.

An additional charge will be made for bushings, extra tappings, crating and name plates.

* **See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.

Use a larger boiler for soft coal.

SUNRAY SECTIONAL WATER BOILERS

50 E Series

Number	* Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
54 E	750	$205.00	42	20 x 20	33 x 32	1–3	8
55 E	1000	250.00	48	20 x 26	33 x 38	2–3	8
56 E	1250	315.00	54	20 x 32	33 x 45	2–3	10
57 E	1500	360.00	60	20 x 38	33 x 51	2–3	10

Height of outlets . . . . . 52 inches.
Width of boiler, including trimmings . . . . . 30 inches.
Deduct for smoke hood, 12 inches.
For additional measurements, see pages 34 and 35.
See trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 174 to 182.
An additional charge will be made for bushings, extra tappings, crating and name plates.
* **See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

SUNRAY SECTIONAL STEAM BOILERS

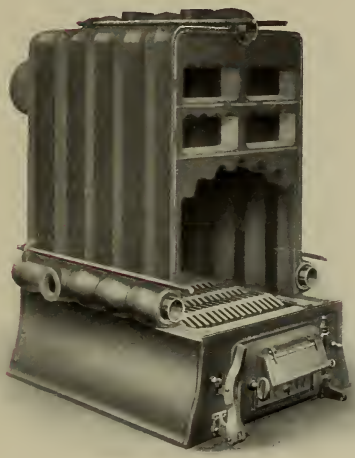
90 A Series

Number	* Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
95 A	800	$340.00	54	24 x 30	40 x 40	2–3	10
96 A	1000	400.00	60	24 x 36	40 x 46	2–3	10
97 A	1200	460.00	67	24 x 42	40 x 52	3–3	12
98 A	1400	520.00	73	24 x 48	40 x 58	3–3	12

Height of outlets . . 59¼ inches. Height of water line . . 46 inches.
Width of boiler, including trimmings . . . . . 38 inches.
Deduct for smoke hood, 15 inches.
For additional measurements, see pages 34 and 35.
See trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 174 to 182.
An additional charge will be made for bushings, extra tappings, crating and name plates.
* **See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

SUNRAY SECTIONAL WATER BOILERS

90 A Series



Number	* Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
95 A	1325	$330.00	54	24 x 30	40 x 40	2–3	10
96 A	1650	390.00	60	24 x 36	40 x 46	2–3	10
97 A	1975	450.00	67	24 x 42	40 x 52	3–3	12
98 A	2300	510.00	73	24 x 48	40 x 58	3–3	12

Height of outlet . . . . . 59¼ inches.
Width of boiler, including trimmings . . . . . 38 inches.
Deduct for smoke hood, 15 inches.
For additional measurements, see pages 34 and 35.
See trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 174 to 182.
An additional charge will be made for bushings, extra tappings, crating and name plates.
* **See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

SUNRAY SECTIONAL STEAM BOILERS

320 Series

Number	*Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
326	1650	$605.00	58	32 x 34	50 x 50	2–4	14
327	2000	700.00	65	32 x 40	50 x 57	2–4	14
328	2350	795.00	71	32 x 47	50 x 63	2–4	14
329	2700	875.00	77	32 x 53	50 x 69	3–4	14

Height of outlet . . . 66 inches. Height of water line . . . 52 inches.

Width of boiler, including trimmings . . . . . 46 inches.

Deduct for smoke hood, 10 inches.

For additional measurements, see pages 34 and 35.

See trimmings, grates, etc., page 44.

For price list of boiler parts, see pages 174 to 182.

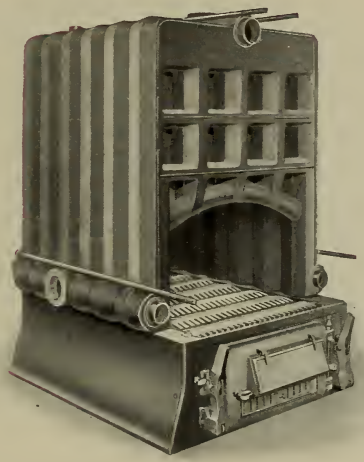
An additional charge will be made for bushings, extra tappings, crating and name plates.

* See **Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.

Use a larger boiler for soft coal.

SUNRAY SECTIONAL WATER BOILERS

320 Series



Number	*Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
326	2700	$585.00	58	32 x 34	50 x 50	2–4	14
327	3300	680.00	65	32 x 40	50 x 57	2–4	14
328	3900	775.00	71	32 x 47	50 x 63	2–4	14
329	4500	855.00	77	32 x 53	50 x 69	3–4	14

Height of outlet . . . . . 66 inches.

Width of boiler, including trimmings . . . . . 46 inches.

Deduct for smoke hood, 10 inches.

For additional measurements, see pages 34 and 35.

See trimmings, grates, etc., page 44.

For price list of boiler parts, see pages 174 to 182.

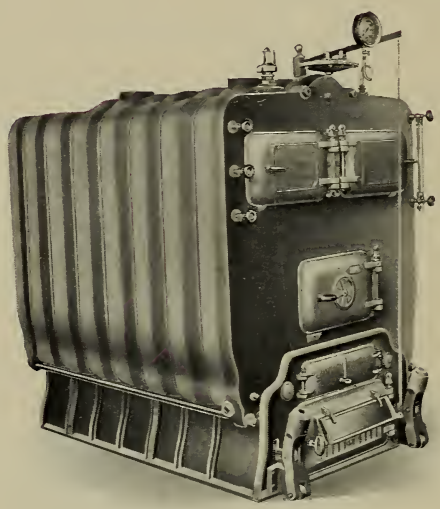
An additional charge will be made for bushings, extra tappings, crating and name plates.

***See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.

Use a larger boiler for soft coal.

SUNRAY SECTIONAL STEAM BOILERS

230 Series



Number	* Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
235	1900	$675.00	60	37 x 32	48 x 44	2–4	12
236	2350	795.00	68	37 x 40	48 x 50	2–4	12
237	2800	905.00	76	37 x 48	48 x 58	2-4	13
238	3250	995.00	84	37 x 56	48 x 66	3–4	13
239	3700	1085.00	92	37 x 64	48 x 74	3–4	14
240	4150	1175.00	100	37 x 72	48 x 82	3–4	14

Height of outlet . . 65 inches. Height of water line . . 54½ inches.

Width of boiler, including trimmings . . . . . 49 inches.

Deduct for smoke hood, 14 inches.

For additional measurements, see pages 34 and 35.

See trimmings, grates, etc., page 44.

For price list of boiler parts, see pages 174 to 182.

An additional charge will be made for bushings, extra tappings, crating and name plates.

* See Ratings and Guarantee, pages 6 and 7. Telegraph code, pages 223 to 236.

Use a larger boiler for soft coal.

SUNRAY SECTIONAL WATER BOILERS

230 Series

Number	* Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
235	3150	$655.00	60	37 x 32	48 x 42	2–4	12
236	3900	775.00	68	37 x 40	48 x 50	2–4	12
237	4650	885.00	76	37 x 48	48 x 58	2–4	13
238	5450	975.00	84	37 x 56	48 x 66	3–4	13
239	6150	1065.00	92	37 x 64	48 x 74	3–4	14
240	6900	1155.00	100	37 x 72	48 x 82	3–4	14

Height of outlet . . . . . 65 inches.

Width of boiler, including trimmings . . . . . 49 inches.

Deduct for smoke hood, 14 inches.

For additional measurements, see pages 34 and 35.

See trimmings, grates, etc., page 44.

For price list of boiler parts, see pages 174 to 182.

An additional charge will be made for bushings, extra tappings, crating and name plates.

* **See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.

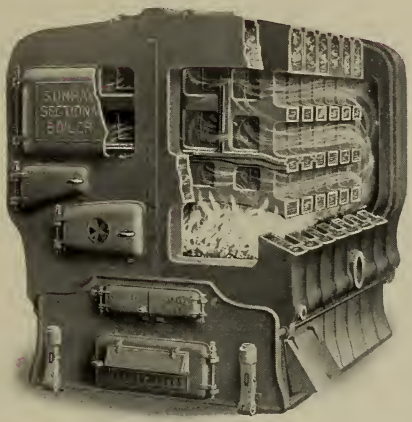
Use a larger boiler for soft coal.

SUNRAY SECTIONAL STEAM BOILERS
WN 270 Series

Number	* Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
WN 276	4100	$1164.00	69	50 x 45	63 x 56	3–5	18
WN 277	4950	1334.00	78	50 x 54	63 x 65	3–5	18
WN 278	5800	1504.00	87	50 x 63	63 x 74	3–5	20
WN 279	6650	1674.00	96	50 x 72	63 x 83	4–5	20
WN 280	7500	1844.00	105	50 x 81	63 x 92	4–5	21
WN 281	8350	2014.00	114	50 x 90	63 x 101	4–5	21

Height of outlet . . 79½ inches. Height of water line . . 66 inches.
Width of boiler, including trimmings . . . . . 72 inches.
Deduct for smoke hood, 15 inches.
For additional measurements, see pages 34 and 35.
See trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 174 to 182.
An additional charge will be made for bushings, extra tappings, crating and name plates.
* **See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

SUNRAY SECTIONAL WATER BOILERS
WN 270 Series

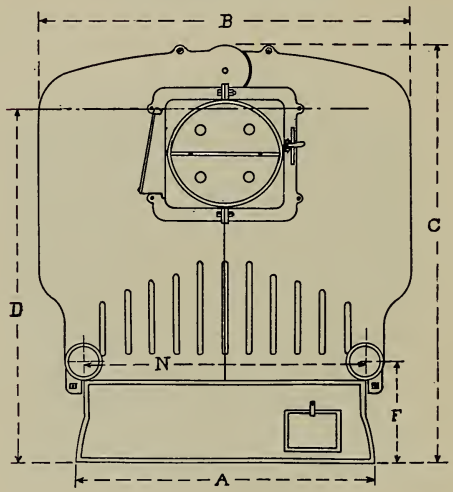


Number	* Rating Square Feet	Price List	Total Length Inches	Fire-pot Area Inches	Foundation Inches	Outlets and Inlets Inches	Smoke Pipe Inches
WN 276	6400	$1144.00	69	50 x 45	63 x 56	3–5	18
WN 277	7800	1314.00	78	50 x 54	63 x 65	3–5	18
WN 278	9200	1484.00	87	50 x 63	63 x 74	3–5	20
WN 279	10600	1654.00	96	50 x 72	63 x 83	4–5	20
WN 280	12000	1824.00	105	50 x 81	63 x 92	4–5	21
WN 281	13400	1994.00	114	50 x 90	63 x 101	4–5	21

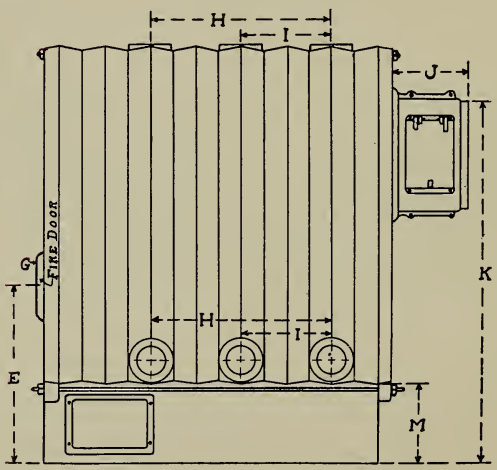
Height of outlet . . . . . 79½ inches.
Width of boiler, including trimmings . . . . . 72 inches.
Deduct for smoke hood, 15 inches.
For additional measurements, see pages 34 and 35.
See trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 175 to 182.
An additional charge will be made for bushings, extra tappings, cratings and name plates.
* **See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

SUNRAY SECTIONAL BOILERS

MEASUREMENTS



REAR VIEW



SECTIONAL VIEW

For detailed measurements, see opposite page

SUNRAY SECTIONAL BOILERS

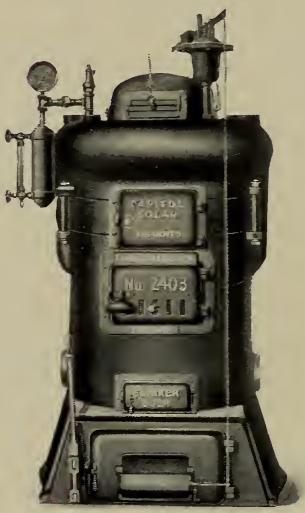
MEASUREMENTS

	50–E Series Inches	90–A Series Inches	320 Series Inches	230 Series Inches	270 Series Inches
A	30	36	44	41	58½
B	30	36	44	49	72
C	52	58½	68½	65	79½
D	44	46	54½	52	66
E	25½	26	30½	29	33½
F	16	16	20½	17¼	20½
G	16¾ x 8½	16 x 10	16 x 10	16 x 10½	17½ x 10
H	25¼	26	26	32	36
I	12⅝	13	13	16	18
J	12	15	10	14	15
K	47	54	62½	56½	69½
L	41	49	57	49½	59
M	13½	13	15	13½	16
N	..	..	..	..	53
O	8 or 10	10	11 x 15	14	21
P	..	..	..	..	21½

For detailed drawings, see opposite page.
Extra tappings can be supplied at an additional charge.
On steam boilers connect all supply tappings full size to main.
Special foundations, page 217.
Amount of asbestos cement to cover, pages 221 and 222.

CAPITOL SOLAR BOILERS IMPROVED

STEAM



Number	* Rating Square Feet	Price List	Diameter Fire-pot Inches	Height Water Line Inches	Height Outlets Inches	Outlets and Inlets Inches	Smoke Pipe Inches
702 S	250	$170.00	17	40¾	45¾	2–2½	8
1002 S	300	193.00	17	44¾	49¾	2–2½	8
1003 S	350	216.00	17	50½	55½	2–2½	8
1004 S	400	250.00	17	56½	61½	2–2½	8
1402 S	450	267.00	20	45	51¼	2–2½	9
1403 S	500	285.00	20	50¼	56½	2–2½	9
1404 S	550	302.00	20	55¾	62	2–2½	9
1803 S	625	360.00	23	49¾	56½	2–3	10
1804 S	700	388.00	23	55¼	62	2–3	10
1805 S	750	411.00	23	60½	67¼	2–3	10
2403 S	800	430.00	26	49¾	58¼	2–3½	10
2404 S	900	468.00	26	55	63½	2–3½	10
2405 S	975	496.00	26	60½	69	2–3½	10
3303 S	1100	543.00	29	51½	59½	2–4	12
3304 S	1225	590.00	29	56¾	64¾	2–4	12
3305 S	1325	628.00	29	62	70	2–4	12

Additional measurements, pages 40 and 41, and trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 175 to 182.
*** See Ratings and Guarantee, pages 6 and 7.** Telegraph code, 223 to 236.
Use a larger boiler for soft coal.

CAPITOL SOLAR BOILERS IMPROVED

WATER

Number	* Rating Square Feet	Price List	Diameter Fire-pot Inches	Height Outlets Inches	Outlets and Inlets Inches	Smoke Pipe Inches
702 W	400	$148.00	17	42	2–2½	8
1002 W	500	182.00	17	46	2–2½	8
1003 W	575	205.00	17	52	2–2½	8
1004 W	650	239.00	17	57¾	2–2½	8
1402 W	750	255.00	20	46	2–2½	9
1403 W	825	273 00	20	51¼	2–2½	9
1404 W	900	290.00	20	56½	2–2½	9
1803 W	1025	350 00	23	50½	2–3	10
1804 W	1150	375.00	23	55¾	2–3	10
1805 W	1250	398.00	23	61	2–3	10
2403 W	1325	417.00	26	51¼	2–3½	10
2404 W	1500	455.00	26	56½	2–3½	10
2405 W	1600	483 00	26	62	2–3½	10
3303 W	1825	530.00	29	52½	2–4	12
3304 W	2025	575 00	29	57¾	2–4	12
3305 W	2175	613.00	29	63	2–4	12

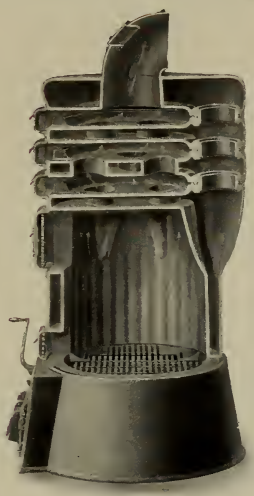
Additional measurements, pages 40 and 41, and trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 175 to 182.
*** See Ratings and Guarantee, pages 6 and 7.** Telegraph code, 223 to 236.
Use a larger boiler for soft coal.

FURMAN ROUND STEAM BOILERS

Number	* Rating Square Feet	Price List	Diameter Fire-pot Inches	Height Water Line Inches	Height Outlets Inches	Outlets and Inlets Inches	Smoke Pipe Inches
16–0	250	$152.00	16	44	48	2–2	6
16–1	300	158.00	16	48½	52½	2–2	6
16–2	350	176.50	16	53	57	2–2	6
19–0	380	192.00	19	45	49	2–2½	7
19–1	400	204.00	19	49½	53½	2–2½	7
19–2	450	218.00	19	54	58	2–2½	7
22–0	500	233.00	22	46	50	2–3	8
22–1	550	245.50	22	50½	54½	2–3	8
22–2	600	259.50	22	55	59	2–3	8
22–3	650	273.50	22	59½	63½	2–3	8
25–0	675	290.00	25	47	51	2–3	9
25–1	700	316.50	25	51½	55½	2–3	9
25–2	800	349.50	25	56	60	2–3	9
25–3	900	382.50	25	60½	64½	2–3	9
29–0	950	380.00	29	47	55	2–4	10
29–1	1000	411.00	29	51½	59	2–4	10
29–2	1100	442.50	29	56	63½	2–4	10
29–3	1200	473.00	29	60½	68	2–4	10

Additional measurements, pages 42 and 43, and trimmings, grates, etc., page 44.
For price list of boiler parts, see pages 175 to 182.
* **See Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236.
Use a larger boiler for soft coal.

FURMAN ROUND WATER BOILERS

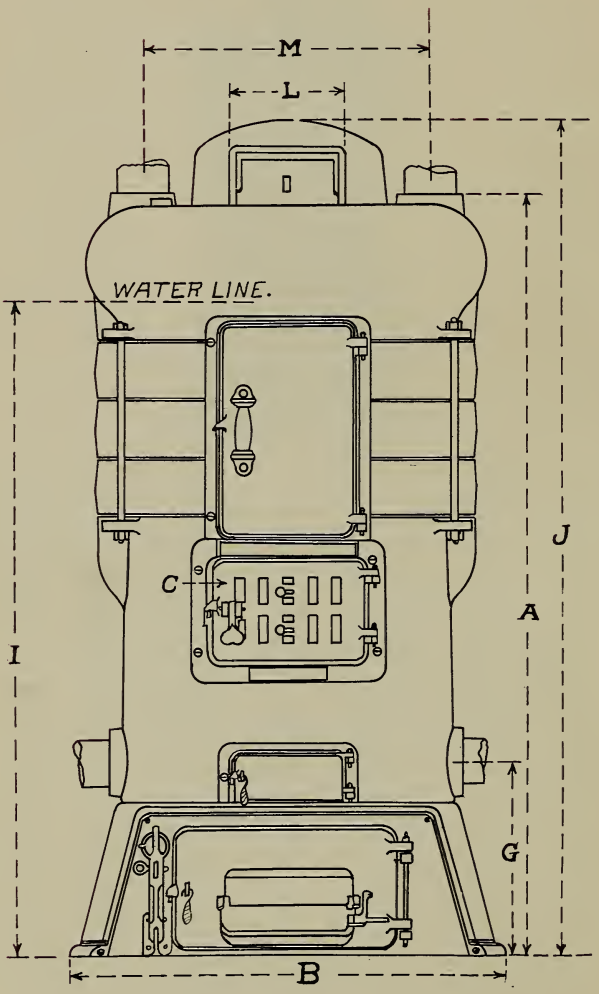


Number	*Rating Square Feet	Price List	Diameter Fire-pot Inches	Height Outlets Inches	Outlets and Inlets Inches	Smoke Pipe Inches
0–16	425	$142.00	16	44	2–2	6
1–16	500	144.00	16	48½	2–2	6
2–16	575	167.00	16	53	2–2	6
0–19	625	182.00	19	45	2–2½	7
1–19	650	194.00	19	49½	2–2½	7
2–19	750	208.00	19	54	2–2½	7
0–22	850	223.00	22	46	2–3	8
1–22	900	236.50	22	50½	2–3	8
2–22	1000	250.00	22	55	2–3	8
3–22	1100	263.50	22	59½	2–3	8
0–25	1100	280.00	25	47	2–3	9
1–25	1150	308.00	25	51½	2–3	9
2–25	1325	338.50	25	56	2–3	9
3–25	1500	369.00	25	60½	2–3	9
0–29	1500	370.00	29	50½	2–4	10
1–29	1650	401.00	29	55	2–4	10
2–29	1825	432.00	29	59½	2–4	10
3–29	2000	464.00	29	64	2–4	10

Additional measurements, see pages 42 and 43, and trimmings, grates, etc., page 44. For price list of boiler parts, see pages 175 to 182.
*See **Ratings and Guarantee, pages 6 and 7.** Telegraph code, pages 223 to 236. Use a larger boiler for soft coal.

CAPITOL SOLAR BOILERS IMPROVED

MEASUREMENTS



For detailed measurements, see opposite page

CAPITOL SOLAR BOILERS IMPROVED

MEASUREMENTS

STEAM

Size	A	B	C	G	I	J	L	M
702 S	45¾	27½	8 x 11	13¾	40¾	52½	8	15⅝
1002 S	49¾	27½	8 x 11	13¾	44¾	56½	8	15⅝
1003 S	55½	27½	8 x 11	13¾	50½	62¼	8	15⅝
1004 S	61½	27½	8 x 11	13¾	56½	68	8	15⅝
1402 S	51¼	31¼	9 x 14	14¼	45	57½	9	19¾
1403 S	56½	31¼	9 x 14	14¼	50¼	62¾	9	19¾
1404 S	62	31¼	9 x 14	14¼	55¾	68¼	9	19¾
1803 S	56½	35	9 x 14	15¾	49¾	63	10	22¾
1804 S	62	35	9 x 14	15¾	55¼	68¼	10	22¾
1805 S	67¼	35	9 x 14	15¾	60½	73¾	10	22¾
2403 S	58¼	38¾	9 x 14	16¾	49¾	64¾	10	25
2404 S	63½	38¾	9 x 14	16¾	55	70	10	25
2405 S	69	38¾	9 x 14	16¾	60½	75¼	10	25
3303 S	59½	42½	9⅝ x 18	17¼	51½	66¼	12	28½
3304 S	64¾	42½	9⅝ x 18	17¼	56¾	71½	12	28½
3305 S	70	42½	9⅝ x 18	17¼	62	76¾	12	28½

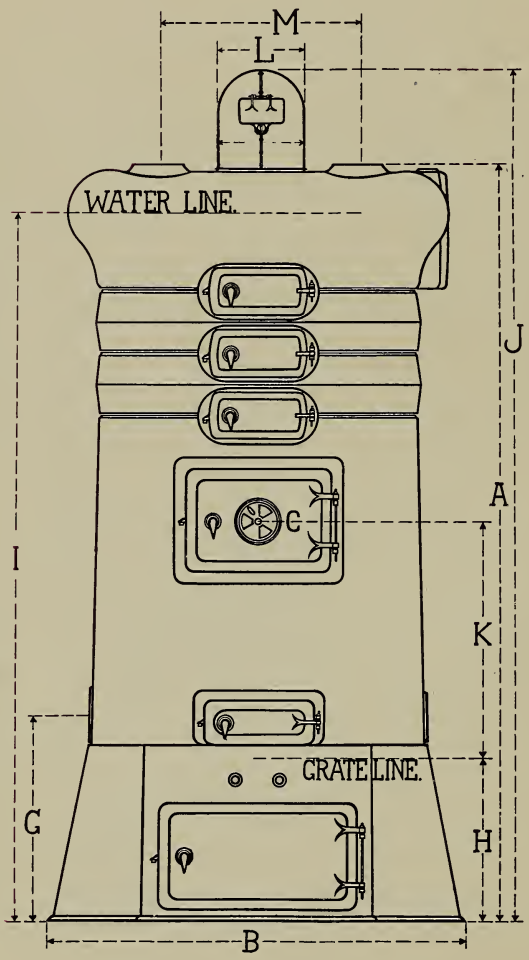
WATER

Size	A	B	C	G	J	L	M
702 W	42	27½	8 x11	13¾	48¾	8	15⅝
1002 W	46	27½	8 x11	13¾	52¾	8	15⅝
1003 W	52	27½	8 x11	13¾	58½	8	15⅝
1004 W	57¾	27½	8 x11	13¾	64¼	8	15⅝
1402 W	46	31¼	9 x14	14¼	52¾	9	19¾
1403 W	51¼	31¼	9 x14	14¼	58	9	19¾
1404 W	56½	31¼	9 x14	14¼	63¼	9	19¾
1803 W	50½	35	9 x14	15¾	57½	10	22¾
1804 W	55¾	35	9 x14	15¾	62¾	10	22¾
1805 W	61	35	9 x14	15¾	68	10	22¾
2403 W	51¼	38¾	9 x14	16¾	58¾	10	25
2404 W	56½	38¾	9 x14	16¾	64	10	25
2405 W	62	38¾	9 x14	16¾	69¼	10	25
3303 W	52½	42½	9⅝ x18	17¼	60	12	28½
3304 W	57¾	42½	9⅝ x18	17¼	65¼	12	28½
3305 W	63	42½	9⅝ x18	17¼	70¾	12	28½

For detailed drawing, see opposite page.
For amount of asbestos cement to cover, see pages 221 and 222.

FURMAN ROUND SECTIONAL BOILERS

MEASUREMENTS



For detailed measurements, see opposite page

FURMAN ROUND SECTIONAL BOILERS

MEASUREMENTS

STEAM

Size	A	B	C	G	I	J	K	L	M
16–0	48	26½	6½ x 9	14¾	44	54	18½	6	10¼
16–1	52½	26½	6½ x 9	14¾	48½	58½	18½	6	10¼
16–2	57	26½	6½ x 9	14¾	53	63	18½	6	10¼
19–0	49	29	8 x 12	15½	45	55½	18½	7	12⅝
19–1	53½	29	8 x 12	15½	49½	60	18½	7	12⅝
19–2	58	29	8 x 12	15½	54	64½	18½	7	12⅝
22–0	49¾	32	8 x 12	16	45¾	59	19	8	13⅜
22–1	54¼	32	8 x 12	16	50½	63½	19	8	13⅜
22–2	59	32	8 x 12	16	55	68	19	8	13⅜
22–3	63½	32	8 x 12	16	59½	72½	19	8	13⅜
25–0	51	35	8 x 12	16	47	62½	19	9	15⅛
25–1	55½	35	8 x 12	16	51½	67	19	9	15⅛
25–2	60	35	8 x 12	16	56	71½	19	9	15⅛
25–3	64½	35	8 x 12	16	60½	76	19	9	15⅛
29–0	52	40	8 x 12	17	48	75½	20	10	17
29–1	56½	40	8 x 12	17	51½	80½	20	10	17
29–2	61	40	8 x 12	17	56	85	20	10	17
29–3	65½	40	8 x 12	17	60½	89½	20	10	17

WATER

Size	A	B	C	G	J	K	L	M
0–16	44	26½	6½ x 9	14¾	50	18½	6	13¾
1–16	48½	26½	6½ x 9	14¾	54½	18½	6	13¾
2–16	53	26½	6½ x 9	14¾	59	18½	6	13¾
0–19	45	29	8 x 12	15½	51½	18½	7	17½
1–19	49½	29	8 x 12	15½	56	18½	7	17½
2–19	54	29	8 x 12	15½	60½	18½	7	17½
0–22	45¾	32	8 x 12	16	55	19	8	19¼
1–22	50¼	32	8 x 12	16	59½	19	8	19¼
2–22	55	32	8 x 12	16	64	19	8	19¼
3–22	59½	32	8 x 12	16	68½	19	8	19¼
0–25	47	35	8 x 12	16	58½	19	9	21¾
1–25	51½	35	8 x 12	16	63	19	9	21¾
2–25	56	35	8 x 12	16	67½	19	9	21¾
3–25	60½	35	8 x 12	16	72	19	9	21¾
0–29	48	40	8 x 12	17	71½	20	10	23¼
1–29	52½	40	8 x 12	17	76½	20	10	23¼
2–29	57	40	8 x 12	17	81	20	10	23¼
3–29	61½	40	8 x 12	17	85½	20	10	23¼

For detailed drawing, see opposite page.
Amount of asbestos to cover, pages 221 and 222.

TRIMMINGS

Trimmings for Steam Boilers include Low Pressure Steam Gauge, Water Gauge, Try Cocks, Safety Valve and Automatic Damper Regulator, and on those types of boilers requiring it, a Water Column. No trimmings are furnished with Water Boilers, Tank Heaters or Laundry Stoves.

GRATES

Furman Square Sectional Boilers are provided with round top shaking and dumping grates suitable for burning all grades of hard or soft coal, coke or wood.

Sunray Square Sectional Boilers are shipped with regular shaking and dumping grates, but on special order fine grates designed for pea coal can be supplied.

Capitol Square Sectional Boilers of the 25 and 37 Series are shipped with grates designed to burn ordinary sizes of hard or soft coal. On special order fine grates for burning pea coal can be supplied. The 48 Series of boilers are shipped with grates designed for fine coal, but on special order can be provided with grates having larger air spaces.

Furman Round Sectional Boilers are provided with triangular rolling grate bars, suitable for all grades of fuel.

Capitol Solar Boilers Improved are provided with flat top shaking and dumping grates, suitable for all grades of fuel.

TOOLS

Firing tools will be furnished with all boilers listed herein, as follows:

Flue brush and handle furnished with all boilers.

Poker furnished with all boilers.

Scraper furnished with all square boilers having a fire-pot length greater than 28 inches and on all round boilers having a fire-pot diameter greater than 27 inches.

No firing tools will be furnished with Junior Boilers, Tank Heaters or Laundry Stoves.

COIL OPENINGS

All boilers listed herein have openings provided for the introduction of a pipe coil in fire-box, for heating water for domestic use. See Auxiliary Heaters, page 154.

A complete price list of repairs for all boilers shown in this catalogue is given on pages 175 to 182.

Telegraph code, pages 223 to 236.

SUNRAY TANK HEATERS

SPECIAL NOTE

The complete line of Tank Heaters shown on the following pages, has a wide range of capacities, and permits the selection of the exact type of Heater that may be required.

CAPACITIES

The capacities herein listed represent the size of Tanks which experience has shown the Heaters will supply for ordinary family use, and are also based on adding about 25 degrees temperature to the water per hour, when connected to a Tank of ample storage capacity.

TESTING

All Tank Heaters listed herein are tested to a hydraulic pressure of 100 pounds before shipping from factory, but it is not advisable to place them on water systems having more than 40 to 50 pounds pressure.

GUARANTEE

Because of the many varying conditions and requirements surrounding the installation of Tank Heaters, they are guaranteed only to the extent of furnishing new castings for any found defective in manufacture.

GENERAL NOTES

A Tank Heater which will heat water to 100 degrees in less than three hours should not be used unless a safety valve is provided to relieve the pressure when the water reaches the boiling point. Frequently hot water is not used for three or four hours, and the water becomes overheated. Unless a safety valve is provided, an excessive pressure may be generated and damage done the apparatus.

On all Tank Heaters used on direct water pressure, or in high buildings, a good sized relief or safety valve should be placed, and this should be set at a pressure 5 pounds above the static pressure when the Heater and Tank are cold, or where the water is below 150 degrees. This is important, for if the water be overheated it will expand and will sometimes increase the pressure to as much as double the ordinary working pressure. A relief or overflow pipe should be carried from the top of roof Tank when connected to a Tank Heater.

Valves should never be placed between a storage Tank and Heater, as excessive pressure will be generated and damage done apparatus and surrounding property should valves be closed while in operation.

SUNRAY LAUNDRY HEATERS

A combination Laundry Stove and Water Heater having a hearth feed door. A cast deflecting plate throws the heat to the front and top of heater. The top plate has two holes with covers and will accommodate a wash boiler or six flat irons.

Made with draw-center grate for burning coal.

No. 2X Laundry Heater

No. 33 Laundry Heater

An efficient and substantial combination Laundry Stove and Water Heater having space for wash boiler or four irons on top and eight irons on sides. Furnished with revolving grates.

Number	Capacity Gallons	Price List	Inside Diameter Fire-pot, Inches	Dimensions of Top, Inches	Tappings Supply and Return, Inches
2X	60	$23.00	10	14 x 21	1
33	50	32.00	10	15 x 15	1

See guarantee and special note, page 45.
Telegraph code, pages 223 to 236.

SUNRAY LAUNDRY AND TANK HEATERS

No. 19 Laundry Heater

A combination Laundry Stove and Water Heater having a large oval top with two holes and covers. A round top with single hole can be furnished if desired.

Made with triangular revolving grates.

A Tank Heater having a deep fire pot, a draft deflecting water arch, a large hearth fuel door and one hole with cover on top. This heater is not adapted for heating irons.

Made with triangular revolving grates.

Nos. 15, 16 and 17 Tank Heaters

Number	Capacity Gallons	Price List	Inside Diameter of Fire-pot, Inches	Depth of Fire-pot, Inches	Tappings Supply and Return, Inches
19	90	$30.00	10	10	1
15	125	37.00	13	12	1½
16	175	46.00	13	15	1½
17	225	58.00	13	18	1½

No. 19 can also be furnished with round flat top having one lid.

See guarantee and special note, page 45.
Telegraph code, pages 223 to 236.

SUNRAY TANK HEATERS

Number	Capacity Gallons	Price List	Inside Diameter Fire-pot Inches	Height Inches	Size of Tapping Inches	Size of Smoke Pipe Inches
60	100	$35.00	10	32	1½	5
61	150	40.00	10	34	1½	5
62	250	60.00	13	36	2	6
63	300	70.00	13	39	2	6
64	350	80.00	15	37	2½	7
65	400	90.00	15	40	2½	7
66	450	100.00	15	43	2½	7

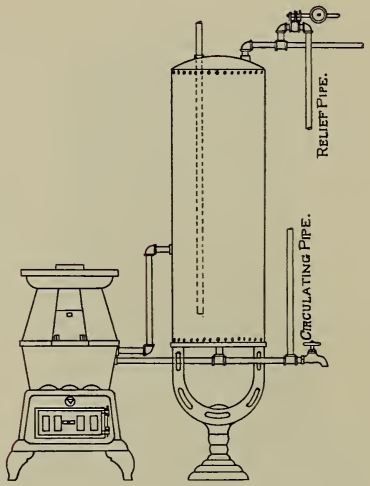
See guarantee and special note, page 45.
Telegraph code, pages 223 to 236.

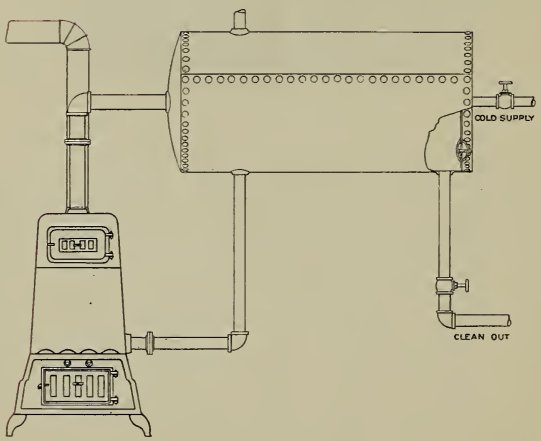
SUNRAY TANK HEATERS

Number	Capacity Gallons	Price List	Inside Diameter Fire-pot Inches	Height Inches	Tappings Supply and Return Inches	Size of Smoke Pipe Inches
67	525	$110.00	17	45	2½	8
68	575	115.00	17	45	2½	8
69	625	128.00	17	47	2½	8
72	675	138.00	20	47	2½	8
73	750	151.00	20	47	2½	8
74	800	164.00	20	49	2½	8

Numbers 68 and 73 have but one intermediate section.
Numbers 69 and 74 have two intermediate sections.
See guarantee and special note, page 45.
Telegraph code, pages 223 to 236.

SUNRAY ROUND TANK HEATERS

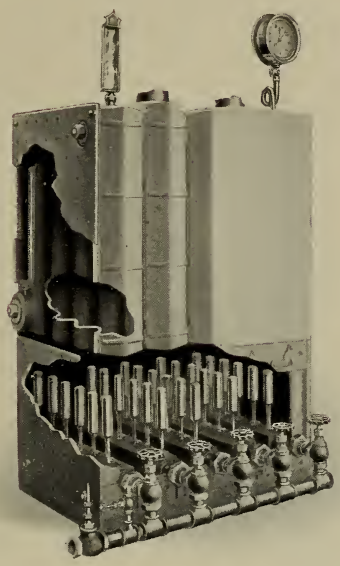




Illustrating connections of a tank heater and tank for supplying water in large quantities. See guarantee and special note, page 45.

SUN GAS WATER HEATERS

FOR GAS FUEL ONLY



DIMENSIONS, CAPACITIES AND PRICES

Size and No. of Sections	Total Height Inches	Depth Inches	Smoke Pipe Inches	Width Inches	Size Tapping	Direct Radiation Supplied	Price
3	41	21	6	17	1–3	500	$130.00
4	41	21	6	22	2–3	800	170.00
5	41	21	6	27	2–3	1000	210.00
6	41	21	6	32	2–3	1200	250.00
7	41	21	6	37	3–3	1400	290.00
8	41	21	2–6	42	3–3	1600	330.00
9	41	21	2–6	47	4–3	1800	370.00
10	41	21	2–6	52	4–3	2000	410.00

Get special circular for further information.

These heaters are specially made for burning natural gas, but can be arranged for artificial gas when so ordered.

Each heater is shipped assembled complete with burner.

For separate gas burners, see page 153.

Telegraph code, pages 223 to 236.

Made at West Newton plant

RADIATOR PRICE LIST

PER SQUARE FOOT OF HEATING SURFACE

Height, inches	45	44	38	32	26	23	22	20½	20	18	17	16½	14½	14	12½
Price per square foot, cents	42	42	42	46	50	53	53	57	57	58	59	60	64	64	68
One-column															
Puritan One-column, Steam and Water	..	..	3	2½	2	..	1⅔	..	..	1⅓					
Florentine One-column, Steam and Water	..	..	3	2½	2	..	1⅔	..	..	1⅓					
Triton One-column, Plain or Ornamental, Steam and Water	..	..	3	2½	2	1⅔	..	..	1½						
Grecian One-column, Steam and Water	..	..	3	2½	2	1⅔	..	..	1½						
Two-column															
Puritan Two-column, Steam and Water	5	..	4	3⅓	2⅔	..	2¼	..	..	1¾					
Florentine Two-column, Steam and Water	5	..	4	3⅓	2⅔	..	2¼	..	..	1¾					
Triton Two-column, Plain or Ornamental, Steam and Water	..	5	4	3⅓	2⅔	2⅓	..	..	2						
Grecian Two-column, Steam and Water	5	..	4	3⅓	2⅔	2⅓	..	..	2						
Sun Two-column, Steam and Water	5	..	4	3⅓	2⅔	2⅓	..	..	2						
Three-column															
Puritan Three-column, Steam and Water	..	6	5	4½	3¾	..	3	..	..	2¼					
Florentine Three-column, Steam and Water	..	6	5	4½	3¾	..	3	..	..	2¼					
Triton Three-column, Plain or Ornamental, Steam and Water	..	6	5	4½	3¾	3¼	..	..	2¾	2¼					
Grecian Three-column, Steam and Water	6	..	5	4½	3¾	3¼	..	..	2¾						
Sun Three-column, Steam and Water	6	..	5	4½	3¾	3¼	..	..	2¾						
Four-column															
Puritan Four-column, Steam and Water	..	10	8½	7	5½	..	4½	..	..	3½					
Florentine Four-column, Steam and Water	..	10	8½	7	5½	..	4½	..	..	3½					
Triton Four-column, Plain or Ornamental, Steam and Water	..	10	8½	7	5½	4½	..	..	4	3½					
Grecian Four-column, Steam and Water	10	..	8	6½	5	4¼	..	..	3½						

Window																
Puritan Five-column, Steam and Water	..	..	..	..	..	..	..	..	5½	..	4¾	..	..	4		
Triton Five-column, Plain or Ornamental, Steam and Water	..	..	..	..	..	..	..	5½	..	..	..	4⅔	4	..	4	3⅓
Utility Six-column, Steam and Water	..	..	..	..	7	..	6	..	..	5	..	..	..	4		
Triton Flue, Steam and Water	..	..	7	5¾	4½	..	..	..	3¼							

The number of square feet contained per section is shown opposite each pattern under the different heights in which it is made.

ATHENIAN WALL RADIATORS

FOR STEAM AND WATER

Large section, 9 square feet; Standard section, 7 square feet, per square foot	$0.42
Small section, 5 square feet, per square foot	.46

INDIRECT RADIATORS

FOR STEAM AND WATER

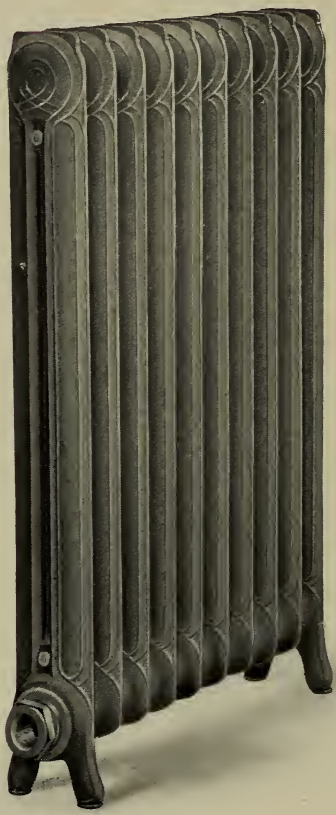
Pin, 10 square feet per section, with slip nipple joints, per section	$2.70
Pin, 15 square feet per section, with slip nipple joints, per section	4.05
Pin, 20 square feet per section, with slip nipple joints, per section	5.40
Champion, prime surface 10 square feet per section	2.70

NOTE—When so ordered, Pin Indirect Radiators can be furnished with hexagonal center screw nipple connections or inside R. and L. screw nipples for either of which 10 per cent will be added to net price. Extra for assembling Indirect Radiators one cent per square foot, net.

Above prices subject to change without notice.

PURITAN ONE-COLUMN RADIATORS

FOR STEAM AND WATER



Each section is 4½ inches wide. Width of legs, 5½ inches.

THIS pattern of One-Column Radiators is made in the following special forms only: Side Wall for Concealed Brackets, steam and water, page 116; Legs extra high, solid and detachable, for steam and water, page 118; Marble Top, for steam and water, page 119.

PURITAN ONE-COLUMN RADIATORS

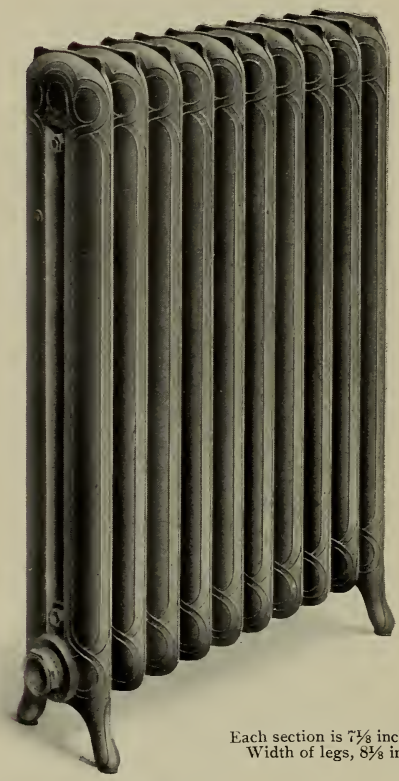
LIST OF SIZES

Number of Sections	*Length Inches	Heating Surface				
		38 Inches Height 3 Square Feet per Section	32 Inches Height 2½ Square Feet per Section	26 Inches Height 2 Square Feet per Section	22 Inches Height 1⅔ Square Feet per Section	18 Inches Height 1⅓ Square Feet per Section
2	5	6	5	4	3⅓	2⅔
3	7½	9	7½	6	5	4
4	10	12	10	8	6⅔	5⅓
5	12½	15	12½	10	8⅓	6⅔
6	15	18	15	12	10	8
7	17½	21	17½	14	11⅔	9⅓
8	20	24	20	16	13⅓	10⅔
9	22½	27	22½	18	15	12
10	25	30	25	20	16⅔	13⅓
11	27½	33	27½	22	18⅓	14⅔
12	30	36	30	24	20	16
13	32½	39	32½	26	21⅔	17⅓
14	35	42	35	28	23⅓	18⅔
15	37½	45	37½	30	25	20
16	40	48	40	32	26⅔	21⅓
17	42½	51	42½	34	28⅓	22⅔
18	45	54	45	36	30	24
19	47½	57	47½	38	31⅔	25⅓
20	50	60	50	40	33⅓	26⅔
21	52½	63	52½	42	35	28
22	55	66	55	44	36⅔	29⅓
23	57½	69	57½	46	38⅓	30⅔
24	60	72	60	48	40	32
25	62½	75	62½	50	41⅔	33⅓
26	65	78	65	52	43⅓	34⅔
27	67½	81	67½	54	45	36
28	70	84	70	56	46⅔	37⅓
29	72½	87	72½	58	48⅓	38⅔
30	75	90	75	60	50	40

Above radiators tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
*Allow ½ inch for each bushing in estimating length of radiator.

PURITAN TWO-COLUMN RADIATORS

FOR STEAM AND WATER



Each section is 7⅛ inches wide
Width of legs, 8⅞ inches

THIS pattern of Two-Column Radiators is made in the following special forms only, at Detroit plant: Side Wall for Concealed Brackets, steam and water, page 116; Legs extra high, solid (excepting 45-inch heights), for steam and water, page 118; Legs extra high, detachable, for steam and water, page 118; Direct-Indirect, for steam and water, page 70; Marble Top, for steam and water, page 119.

PURITAN TWO-COLUMN RADIATORS

LIST OF SIZES

Number of Sections	*Length Inches	Heating Surface					
		45 Inches Height 5 Square Feet per Section	38 Inches Height 4 Square Feet per Section	32 Inches Height 3⅓ Square Feet per Section	26 Inches Height 2⅔ Square Feet per Section	22 Inches Height 2¼ Square Feet per Section	18 Inches Height 1¾ Square Feet per Section
2	5	10	8	6⅔	5⅓	4½	3½
3	7½	15	12	10	8	6¾	5¼
4	10	20	16	13⅓	10⅔	9	7
5	12½	25	20	16⅔	13⅓	11¼	8¾
6	15	30	24	20	16	13½	10½
7	17½	35	28	23⅓	18⅔	15¾	12¼
8	20	40	32	26⅔	21⅓	18	14
9	22½	45	36	30	24	20¼	15¾
10	25	50	40	33⅓	26⅔	22½	17½
11	27½	55	44	36⅔	29⅓	24¾	19¼
12	30	60	48	40	32	27	21
13	32½	65	52	43⅓	34⅔	29¼	22¾
14	35	70	56	46⅔	37⅓	31½	24½
15	37½	75	60	50	40	33¾	26¼
16	40	80	64	53⅓	42⅔	36	28
17	42½	85	68	56⅔	45⅓	38¼	29¾
18	45	90	72	60	48	40½	31½
19	47½	95	76	63⅓	50⅔	42¾	33¼
20	50	100	80	66⅔	53⅓	45	35
21	52½	105	84	70	56	47¼	36¾
22	55	110	88	73⅓	58⅔	49½	38½
23	57½	115	92	76⅔	61⅓	51¾	40¼
24	60	120	96	80	64	54	42
25	62½	125	100	83⅓	66⅔	56¼	43¾
26	65	130	104	86⅔	69⅓	58½	45½
27	67½	135	108	90	72	60¾	47¼
28	70	140	112	93⅓	74⅔	63	49
29	72½	145	116	96⅔	77⅓	65¼	50¾
30	75	150	120	100	80	67½	52½

Above radiators are tapped 2 inches and bushed as per list on page 121.

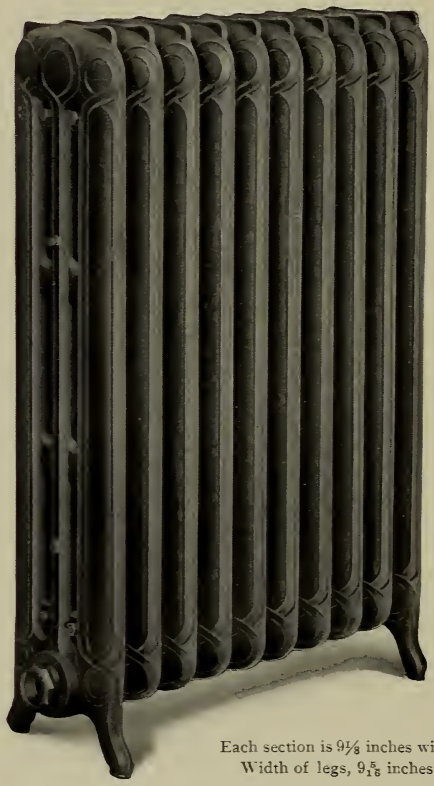
Distance from floor to center of tapping, page 120.

On special order, above radiators for steam can be furnished with screw nipple at Detroit plant only.

* Allow ½ inch for each bushing in estimating length of radiator.

PURITAN THREE-COLUMN RADIATORS

FOR STEAM AND WATER



Each section is 9⅛ inches wide
Width of legs, $9\frac{5}{16}$ inches

THIS pattern of Three-Column Radiators is made in the following special forms only, at Detroit plant: Side Wall for Concealed Brackets, steam and water, page 116: Legs extra high, solid (excepting 44-inch heights), for steam and water, page 118; Legs extra high, detachable, for steam and water, page 118: Direct-Indirect, for steam and water, page 70; Marble Top, for steam and water, page 119.

PURITAN THREE-COLUMN RADIATORS

LIST OF SIZES

Number of Sections	*Length Inches	Heating Surface					
		44 Inches Height 6 Square Feet per Section	38 Inches Height 5 Square Feet per Section	32 Inches Height 4½ Square Feet per Section	26 Inches Height 3¾ Square Feet per Section	22 Inches Height 3 Square Feet per Section	18 Inches Height 2¼ Square Feet per Section
2	5	12	10	9	7½	6	4½
3	7½	18	15	13½	11¼	9	6¾
4	10	24	20	18	15	12	9
5	12½	30	25	22½	18¾	15	11¼
6	15	36	30	27	22½	18	13½
7	17½	42	35	31½	26¼	21	15¾
8	20	48	40	36	30	24	18
9	22½	54	45	40½	33¾	27	20¼
10	25	60	50	45	37½	30	22½
11	27½	66	55	49½	41¼	33	24¾
12	30	72	60	54	45	36	27
13	32½	78	65	58½	48¾	39	29¼
14	35	84	70	63	52½	42	31½
15	37½	90	75	67½	56¼	45	33¾
16	40	96	80	72	60	48	36
17	42½	102	85	76½	63¾	51	38¼
18	45	108	90	81	67½	54	40½
19	47½	114	95	85½	71¼	57	42¾
20	50	120	100	90	75	60	45
21	52½	126	105	94½	78¾	63	47¼
22	55	132	110	99	82½	66	49½
23	57½	138	115	103½	86¼	69	51¾
24	60	144	120	108	90	72	54
25	62½	150	125	112½	93¾	75	56¼
26	65	156	130	117	97½	78	58½
27	67½	162	135	121½	101¼	81	60¾
28	70	168	140	126	105	84	63
29	72½	174	145	130½	108¾	87	65¼
30	75	180	150	135	112½	90	67½

Above radiators are tapped 2 inches and bushed as per list on page 121.

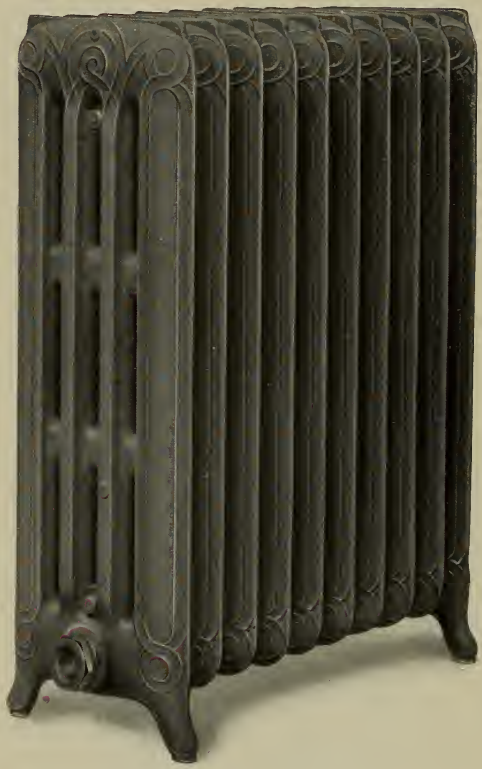
Distance from floor to center of tapping, page 120.

On special order, above radiators for steam can be furnished with screw nipples, at Detroit plant only.

*Allow ½ inch for each bushing in estimating length of radiator.

PURITAN FOUR-COLUMN RADIATORS

FOR STEAM AND WATER



Each section is 12½ inches wide. Width of legs, 13½ inches.

THIS pattern of Four-Column Radiators is made in the following special forms only: Side Wall for Concealed Brackets, steam and water, page 116; Legs extra high, solid (excepting 44-inch heights), for steam and water, page 118; Legs extra high, detachable, for steam and water, page 118; Direct-Indirect, for steam and water, page 70; Marble Top, for steam and water, page 119.

PURITAN FOUR-COLUMN RADIATORS

LIST OF SIZES

Number of Sections	*Length Inches	Heating Surface					
		44 Inches Height 10 Square Feet per Section	38 Inches Height 8½ Square Feet per Section	32 Inches Height 7 Square Feet per Section	26 Inches Height 5½ Square Feet per Section	22 Inches Height 4½ Square Feet per Section	18 Inches Height 3½ Square Feet per Section
2	5½	20	17	14	11	9	7
3	8¼	30	25½	21	16½	13½	10½
4	11	40	34	28	22	18	14
5	13¾	50	42½	35	27½	22½	17½
6	16½	60	51	42	33	27	21
7	19¼	70	59½	49	38½	31½	24½
8	22	80	68	56	44	36	28
9	24¾	90	76½	63	49½	40½	31½
10	27½	100	85	70	55	45	35
11	30¼	110	93½	77	60½	49½	38½
12	33	120	102	84	66	54	42
13	35¾	130	110½	91	71½	58½	45½
14	38½	140	119	98	77	63	49
15	41¼	150	127½	105	82½	67½	52½
16	44	160	136	112	88	72	56
17	46¾	170	144½	119	93½	76½	59½
18	49½	180	153	126	99	81	63
19	52¼	190	161½	133	104½	85½	66½
20	55	200	170	140	110	90	70
21	57¾	210	178½	147	115½	94½	73½
22	60½	220	187	154	121	99	77
23	63¼	230	195½	161	126½	103½	80½
24	66	240	204	168	132	108	84
25	68¾	250	212½	175	137½	112½	87½
26	71½	260	221	182	143	117	91
27	74¼	270	229½	189	148½	121½	94½
28	77	280	238	196	154	126	98
29	79¾	290	246½	203	159½	130½	101½
30	82½	300	255	210	165	135	105

Above radiators are tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
*Allow ½ inch for each bushing in estimating length of radiator.

PURITAN
FIVE-COLUMN RADIATORS

WINDOW

FOR STEAM AND WATER

Each section is 13 inches wide. Width of legs, 13 inches.

THIS pattern of Five-Column Radiators is made in the following special forms only, at Detroit plant: Legs extra high, solid, for steam and water, page 118; Legs extra high, detachable, for steam and water, page 118; Marble Top, for steam and water, page 119.

PURITAN FIVE-COLUMN RADIATORS

WINDOW

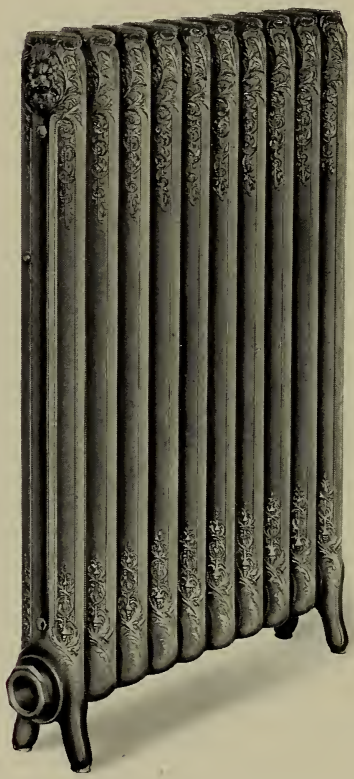
LIST OF SIZES

Number of Sections	*Length Inches	Heating Surface		
		20 Inches Height 5½ Square Feet per Section	17 Inches Height 4¾ Square Feet per Section	14 Inches Height 4 Square Feet per Section
2	6	11	9½	8
3	9	16½	14¼	12
4	12	22	19	16
5	15	27½	23¾	20
6	18	33	28½	24
7	21	38½	33¼	28
8	24	44	38	32
9	27	49½	42¾	36
10	30	55	47½	40
11	33	60½	52¼	44
12	36	66	57	48
13	39	71½	61¾	52
14	42	77	66½	56
15	45	82½	71¼	60
16	48	88	76	64
17	51	93½	80¾	68
18	54	99	85½	72
19	57	104½	90¼	76
20	60	110	95	80
21	63	115½	99¾	84
22	66	121	104½	88
23	69	126½	109¼	92
24	72	132	114	96
25	75	137½	118¾	100
26	78	143	123½	104
27	81	148½	128¼	108
28	84	154	133	112
29	87	159½	137¾	116
30	90	165	142½	120

Above radiators are tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
*Allow ½ inch for each bushing in estimating length of radiators.

FLORENTINE
ONE-COLUMN RADIATORS

FOR STEAM AND WATER

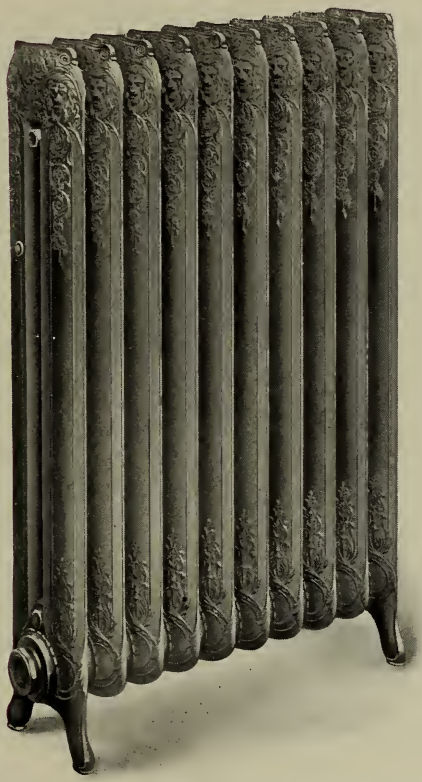


Each section is 4½ inches wide. Width of legs, 5½ inches.
For list of sizes, heights, tappings, etc., see page 55.

THIS pattern of One-Column Radiators is made in the following special forms only: Side Wall for Concealed Brackets, steam and water, page 116; Legs extra high, solid, for steam and water, page 118; Legs extra high, detachable, for steam and water, page 118; Marble Top, for steam and water, page 119.

FLORENTINE TWO-COLUMN RADIATORS

FOR STEAM AND WATER

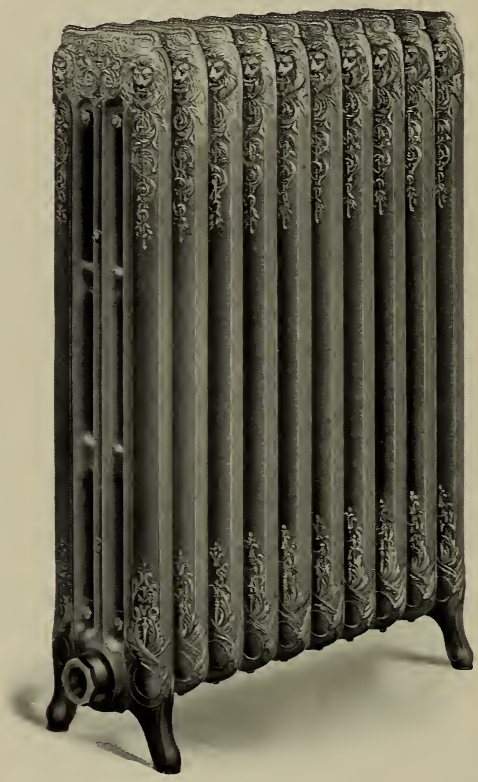


Each section is 7⅛ inches wide. Width of legs, 8⅛ inches.
For list of sizes, heights, tappings, etc., see page 57.

THIS pattern of Two-Column Radiators is made in the following special forms only: Side Wall for Concealed Brackets, steam and water, page 116; Legs extra high, solid (excepting 45-inch heights), for steam and water, page 118; Legs extra high, detachable, for steam and water, page 118; Direct-Indirect, for steam and water, page 70; Marble Top, for steam and water, page 119.

FLORENTINE THREE-COLUMN RADIATORS

FOR STEAM AND WATER

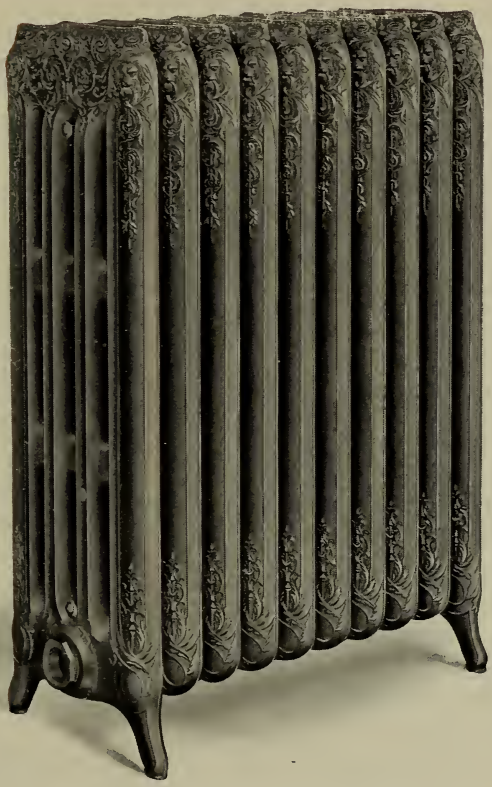


Each section is 9⅛ inches wide. Width of legs, 9$\frac{5}{16}$ inches.
For list of sizes, heights, tappings, etc., see page 59.

THIS pattern of Three-Column Radiators is made in the following special forms only: Side Wall for Concealed Brackets, steam and water, page 116; Legs extra high, solid (excepting 44-inch heights), for steam and water, page 118; Legs extra high, detachable, for steam and water, page 118; Direct-Indirect, for steam and water, page 70; Marble Top, for steam and water, page 119.

FLORENTINE FOUR-COLUMN RADIATORS

FOR STEAM AND WATER

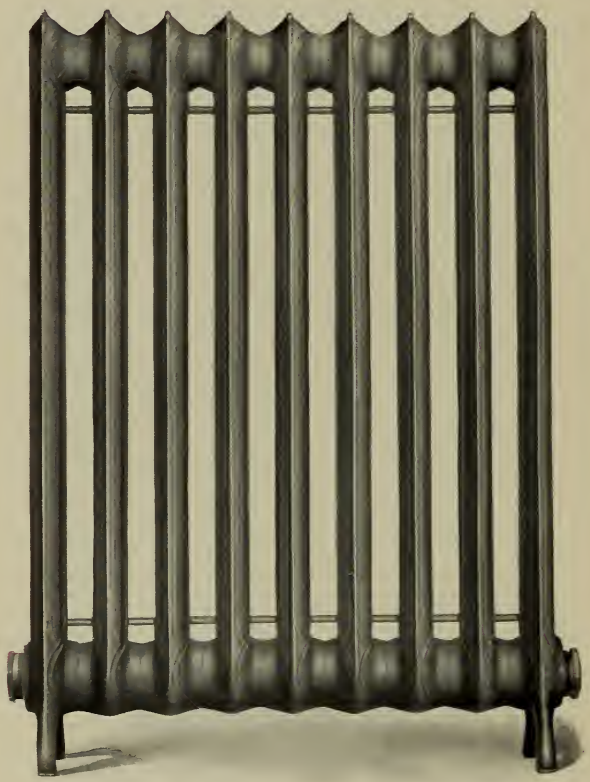


Each section is 12½ inches wide. Width of legs, 13½ inches.
For list of sizes, heights, tappings, etc., see page 61.

THIS pattern of Four-Column Radiators is made in the following special forms only: Side Walls for Concealed Brackets, steam and water, page 116; Legs extra high, solid (excepting 44-inch heights), for steam and water, page 118; Legs extra high, detachable, for steam and water, page 118; Direct-Indirect, for steam and water, page 70; Marble Top, for steam and water, page 119.

PURITAN
TWO-COLUMN HOSPITAL RADIATORS

FOR STEAM AND WATER



Each section is 7⅛ inches wide. Width of legs, 8⅛ inches.

Sections 3 inches on centers. Made in no special forms.

A RADIATOR specially designed for hospitals and other buildings requiring sanitation. The extra large spacings between sections allow easy cleaning.

PURITAN
TWO-COLUMN HOSPITAL RADIATORS

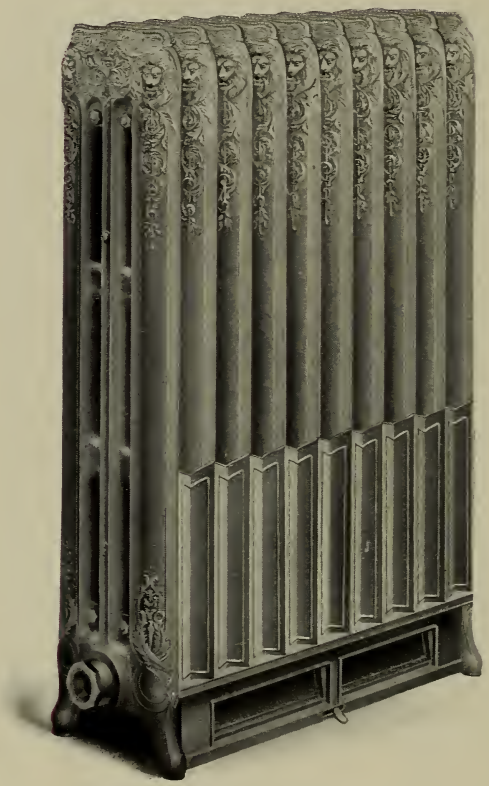
LIST OF SIZES

Number of Sections	*Length Inches	Heating Surface					
		45 Inches Height 5 Square Feet per Section	38 Inches Height 4 Square Feet per Section	32 Inches Height 3⅓ Square Feet per Section	26 Inches Height 2⅔ Square Feet per Section	22 Inches Height 2¼ Square Feet per Section	18 Inches Height 1¾ Square Feet per Section
2	6	10	8	6⅔	5⅓	4½	3½
3	9	15	12	10	8	6¾	5¼
4	12	20	16	13⅓	10⅔	9	7
5	15	25	20	16⅔	13⅓	11¼	8¾
6	18	30	24	20	16	13½	10½
7	21	35	28	23⅓	18⅔	15¾	12¼
8	24	40	32	26⅔	21⅓	18	14
9	27	45	36	30	24	20¼	15¾
10	30	50	40	33⅓	26⅔	22½	17½
11	33	55	44	36⅔	29⅓	24¾	19¼
12	36	60	48	40	32	27	21
13	39	65	52	43⅓	34⅔	29¼	22¾
14	42	70	56	46⅔	37⅓	31½	24½
15	45	75	60	50	40	33¾	26¼
16	48	80	64	53⅓	42⅔	36	28
17	51	85	68	56⅔	45⅓	38¼	29¾
18	54	90	72	60	48	40½	31½
19	57	95	76	63⅓	50⅔	42¾	33¼
20	60	100	80	66⅔	53⅓	45	35
21	63	105	84	70	56	47¼	36¾
22	66	110	88	73⅓	58⅔	49½	38½
23	69	115	92	76⅔	61⅓	51¾	40¼
24	72	120	96	80	64	54	42
25	75	125	100	83⅓	66⅔	56¼	43¾
26	78	130	104	86⅔	69⅓	58½	45½
27	81	135	108	90	72	60¾	47¼
28	84	140	112	93⅓	74⅔	63	49
29	87	145	116	96⅔	77⅓	65¼	50¾
30	90	150	120	100	80	67½	52½

Above radiators tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
On special order, above radiators for steam can be furnished with screw nipples.
*Allow ½ inch for each bushing in estimating length of radiator.

FLORENTINE AND PURITAN DIRECT-INDIRECT RADIATORS

FOR STEAM AND WATER

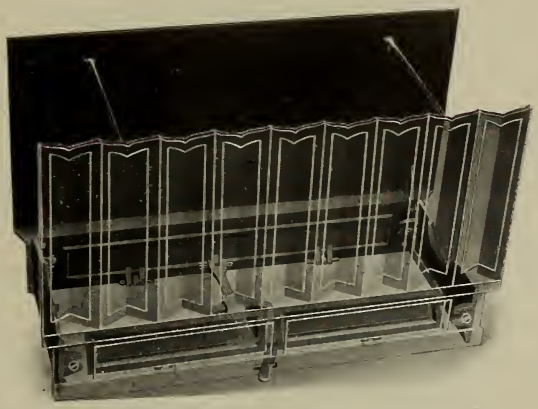


Florentine Radiator with box base applied

CAPITOL Box Bases are made for use on Two, Three and Four-Column Florentine and Puritan design Radiators.

DIRECT-INDIRECT BOX BASE

FOR FLORENTINE AND PURITAN RADIATORS



THE damper arrangement operates both front and back dampers with one lever, adjusting to atmospheric conditions by controlling the intake of cold air as desired.

Above Box Bases are manufactured for use on Two, Three and Four-Column Florentine and Puritan design Radiators. Bottom of back air inlet one-half inch above the floor.

MEASUREMENTS OF BOX BASES

OUTSIDE MEASUREMENTS OF FLANGE FOR ATTACHING PIPE CONNECTION

No.	Description	Flange Inches
7	For seven-section radiator	2⅜ x 10¼
8	For eight-section radiator	2⅜ x 12¾
9	For nine-section radiator	2⅜ x 15¼
10	For ten-section radiator	2⅜ x 17¾
11	For eleven-section radiator	2⅜ x 20¼
12	For twelve-section radiator	2⅜ x 22¾

Above measurements are for Two and Three-Column Radiators. Measurements for Four-Column on application.

All orders for Box Base Radiators should clearly state whether back or bottom air inlet is required. Back opening will be furnished unless otherwise ordered.

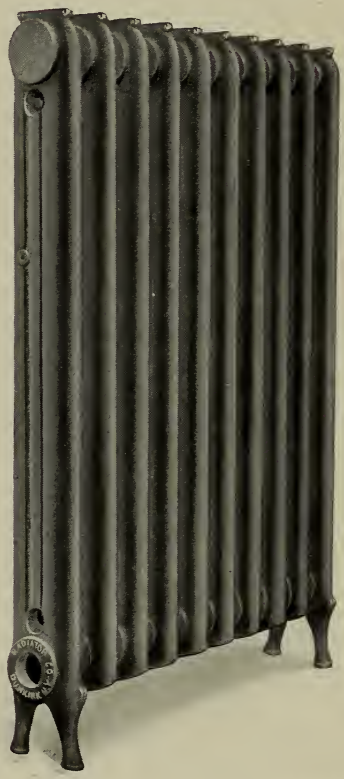
An eleven-section Base is used on eleven or more odd number of sections, and a twelve-section base is used on twelve or more even number of sections.

For wall box, see page 108.

TRITON ONE-COLUMN RADIATORS

PLAIN

FOR STEAM AND WATER



Each section is 4½ inches wide. Width of legs, 5¼ inches.

THIS pattern of One-Column Radiators is made in the following special forms only: Side Wall for Concealed Brackets, steam and water, page 116; Legs extra high, solid, for steam and water, page 118; Marble Top, for steam and water, page 119.

TRITON ONE-COLUMN RADIATORS

LIST OF SIZES

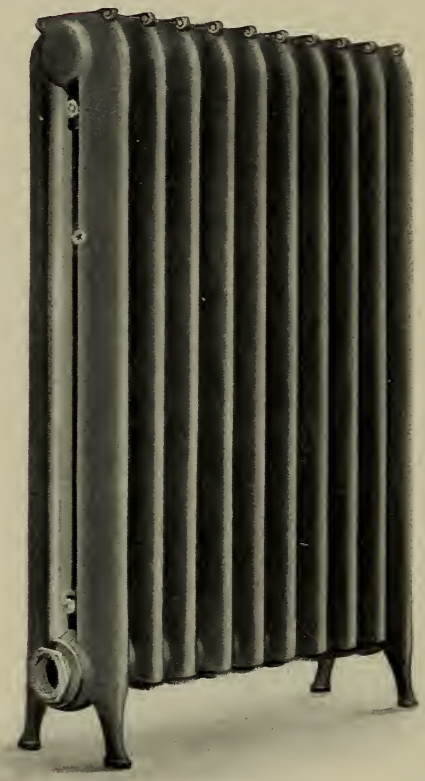
Number of Sections	*Length Inches	Heating Surface				
		38 Inches Height 3 Square Feet per Section	32 Inches Height 2½ Square Feet per Section	26 Inches Height 2 Square Feet per Section	23 Inches Height 1⅔ Square Feet per Section	20 Inches Height 1½ Square Feet per Section
2	5	6	5	4	3⅓	3
3	7½	9	7½	6	5	4½
4	10	12	10	8	6⅔	6
5	12½	15	12½	10	8⅓	7½
6	15	18	15	12	10	9
7	17½	21	17½	14	11⅔	10½
8	20	24	20	16	13⅓	12
9	22½	27	22½	18	15	13½
10	25	30	25	20	16⅔	15
11	27½	33	27½	22	18⅓	16½
12	30	36	30	24	20	18
13	32½	39	32½	26	21⅔	19½
14	35	42	35	28	23⅓	21
15	37½	45	37½	30	25	22½
16	40	48	40	32	26⅔	24
17	42½	51	42½	34	28⅓	25½
18	45	54	45	36	30	27
19	47½	57	47½	38	31⅔	28½
20	50	60	50	40	33⅓	30
21	52½	63	52½	42	35	31½
22	55	66	55	44	36⅔	33
23	57½	69	57½	46	38⅓	34½
24	60	72	60	48	40	36
25	62½	75	62½	50	41⅔	37½
26	65	78	65	52	43⅓	39
27	67½	81	67½	54	45	40½
28	70	84	70	56	46⅔	42
29	72½	87	72½	58	48⅓	43½
30	75	90	75	60	50	45

Above radiators tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
On special order, above radiators can be furnished with screw nipple connections.
*Allow ½ inch for each bushing in estimating length of radiator.

TRITON TWO-COLUMN RADIATORS

PLAIN

FOR STEAM AND WATER



Each section is 7¼ inches wide. Width of legs, 8¼ inches.

THIS pattern of Two-Column Radiators is made in the following special forms only: Side Wall for Concealed Brackets, steam and water, page 116; Legs extra high, solid (excepting 44-inch heights), for steam and water, page 118; Marble Top, for steam and water, page 119.

TRITON TWO-COLUMN RADIATORS

LIST OF SIZES

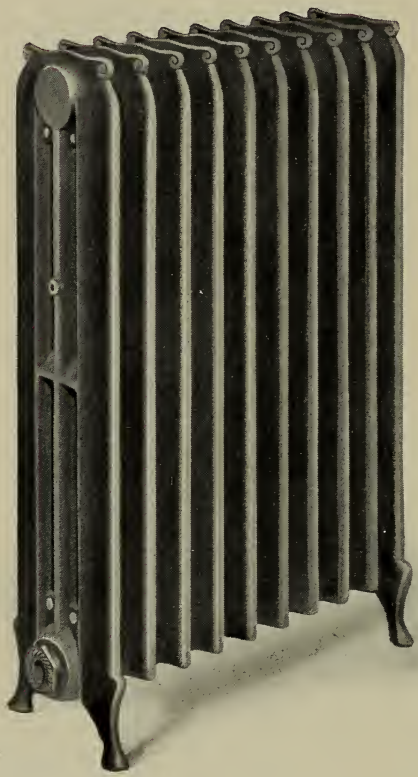
Number of Sections	*Length Inches	Heating Surface					
		44 Inches Height 5 Square Feet per Section	38 Inches Height 4 Square Feet per Section	32 Inches Height 3½ Square Feet per Section	26 Inches Height 2⅔ Square Feet per Section	23 Inches Height 2½ Square Feet per Section	20 Inches Height 2 Square Feet per Section
2	5	10	8	6⅔	5⅓	4⅔	4
3	7½	15	12	10	8	7	6
4	10	20	16	13⅓	10⅔	9⅓	8
5	12½	25	20	16⅔	13⅓	11⅔	10
6	15	30	24	20	16	14	12
7	17½	35	28	23⅓	18⅔	16⅓	14
8	20	40	32	26⅔	21⅓	18⅔	16
9	22½	45	36	30	24	21	18
10	25	50	40	33⅓	26⅔	23⅓	20
11	27½	55	44	36⅔	29⅓	25⅔	22
12	30	60	48	40	32	28	24
13	32½	65	52	43⅓	34⅔	30⅓	26
14	35	70	56	46⅔	37⅓	32⅔	28
15	37½	75	60	50	40	35	30
16	40	80	64	53⅓	42⅔	37⅓	32
17	42½	85	68	56⅔	45⅓	39⅔	34
18	45	90	72	60	48	42	36
19	47½	95	76	63⅓	50⅔	44⅓	38
20	50	100	80	66⅔	53⅓	46⅔	40
21	52½	105	84	70	56	49	42
22	55	110	88	73⅓	58⅔	51⅓	44
23	57½	115	92	76⅔	61⅓	53⅔	46
24	60	120	96	80	64	56	48
25	62½	125	100	83⅓	66⅔	58⅓	50
26	65	130	104	86⅔	69⅓	60⅔	52
27	67½	135	108	90	72	63	54
28	70	140	112	93⅓	74⅔	65⅓	56
29	72½	145	116	96⅔	77⅓	67⅔	58
30	75	150	120	100	80	70	60

Above radiators tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
On special order, above radiators can be furnished with screw nipple connections.
*Allow ½ inch for each bushing in estimating length of radiator.

TRITON THREE-COLUMN RADIATORS

PLAIN

FOR STEAM AND WATER



Each section is 9⅛ inches wide. Width of legs, 10⅛ inches.

THIS pattern of Three-Column Radiators is made in the following special forms only: Side Wall for Concealed Brackets, steam and water, page 116; Legs extra high, solid (excepting 44-inch heights), for steam and water, page 118; Direct-Indirect for steam and water, page 90; Marble Top, for steam and water, page 119.

TRITON THREE-COLUMN RADIATORS

LIST OF SIZES

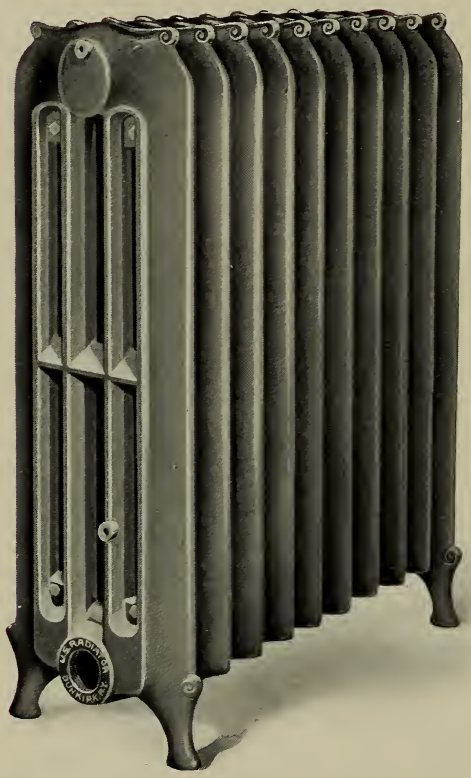
Number of Sections	*Length Inches	Heating Surface						
		44 Inches Height 6 Sq. Feet per Section	38 Inches Height 5 Sq. Feet per Section	32 Inches Height 4½ Sq. Feet per Section	26 Inches Height 3¾ Sq. Feet per Section	23 Inches Height 3¼ Sq. Feet per Section	20 Inches Height 2¾ Sq. Feet per Section	18 Inches Height 2¼ Sq. Feet per Section
2	5	12	10	9	7½	6½	5½	4½
3	7½	18	15	13½	11¼	9¾	8¼	6¾
4	10	24	20	18	15	13	11	9
5	12½	30	25	22½	18¾	16¼	13¾	11¼
6	15	36	30	27	22½	19½	16½	13½
7	17½	42	35	31½	26¼	22¾	19¼	15¾
8	20	48	40	36	30	26	22	18
9	22½	54	45	40½	33¾	29¼	24¾	20¼
10	25	60	50	45	37½	32½	27½	22½
11	27½	66	55	49½	41¼	35¾	30¼	24¾
12	30	72	60	54	45	39	33	27
13	32½	78	65	58½	48¾	42¼	35¾	29¼
14	35	84	70	63	52½	45½	38½	31½
15	37½	90	75	67½	56¼	48¾	41¼	33¾
16	40	96	80	72	60	52	44	36
17	42½	102	85	76½	63¾	55¼	46¾	38¼
18	45	108	90	81	67½	58½	49½	40½
19	47½	114	95	85½	71¼	61¾	52¼	42¾
20	50	120	100	90	75	65	55	45
21	52½	126	105	94½	78¾	68¼	57¾	47¼
22	55	132	110	99	82½	71½	60½	49½
23	57½	138	115	103½	86¼	74¾	63¼	51¾
24	60	144	120	108	90	78	66	54
25	62½	150	125	112½	93¾	81¼	68¾	56¼
26	65	156	130	117	97½	84½	71½	58½
27	67½	162	135	121½	101¼	87¾	74¼	60¾
28	70	168	140	126	105	91	77	63
29	72½	174	145	130½	108¾	94¼	79¾	65¼
30	75	180	150	135	112½	97½	82½	67½

Above radiators tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
On special order, above radiators can be furnished with screw nipple connections.
*Allow ½ inch for each bushing in estimating length of radiator.

TRITON FOUR-COLUMN RADIATORS

PLAIN

FOR STEAM AND WATER



Each section is 12¾ inches wide. Width of legs, 13¾ inches.

THIS pattern of Four-Column Radiators is made in the following special forms only: Legs extra high, solid (excepting 44-inch heights), for steam and water, page 118; Marble Top, for steam and water, page 119.

TRITON FOUR-COLUMN RADIATORS

LIST OF SIZES

Number of Sections	*Length Inches	Heating Surface						
		44 Inches Height 10 Sq. Feet per Section	38 Inches Height 8½ Sq. Feet per Section	32 Inches Height 7 Sq. Feet per Section	26 Inches Height 5½ Sq. Feet per Section	23 Inches Height 4½ Sq. Feet per Section	20 Inches Height 4 Sq. Feet per Section	18 Inches Height 3½ Sq. Feet per Section
2	6	20	17	14	11	9	8	7
3	9	30	25½	21	16½	13½	12	10½
4	12	40	34	28	22	18	16	14
5	15	50	42½	35	27½	22½	20	17½
6	18	60	51	42	33	27	24	21
7	21	70	59½	49	38½	31½	28	24½
8	24	80	68	56	44	36	32	28
9	27	90	76½	63	49½	40½	36	31½
10	30	100	85	70	55	45	40	35
11	33	110	93½	77	60½	49½	44	38½
12	36	120	102	84	66	54	48	42
13	39	130	110½	91	71½	58½	52	45½
14	42	140	119	98	77	63	56	49
15	45	150	127½	105	82½	67½	60	52½
16	48	160	136	112	88	72	64	56
17	51	170	144½	119	93½	76½	68	59½
18	54	180	153	126	99	81	72	63
19	57	190	161½	133	104½	85½	76	66½
20	60	200	170	140	110	90	80	70
21	63	210	178½	147	115½	94½	84	73½
22	66	220	187	154	121	99	88	77
23	69	230	195½	161	126½	103½	92	80½
24	72	240	204	168	132	108	96	84
25	75	250	212½	175	137½	112½	100	87½
26	78	260	221	182	143	117	104	91
27	81	270	229½	189	148½	121½	108	94½
28	84	280	238	196	154	126	112	98
29	87	290	246½	203	159½	130½	116	101½
30	90	300	255	210	165	135	120	105

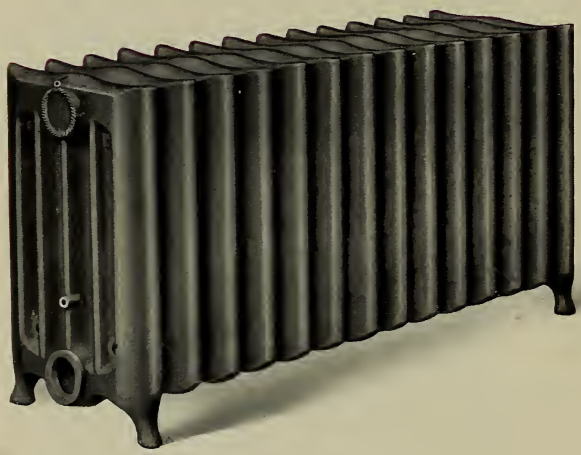
Above radiators tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tappings, page 120.
On special order, above radiators can be furnished with screw nipple connections.
*Allow ½ inch for each bushing in estimating length of radiator.

TRITON FIVE-COLUMN RADIATOR

PLAIN

FOR WINDOW

FOR STEAM AND WATER



Each section is 12¾ inches wide. Width of legs, 12¾ inches.

THIS pattern of Five-Column Radiators is made in the following special forms only; Legs extra high, solid steam and water, page 118.

TRITON FIVE-COLUMN RADIATORS

WINDOW

LIST OF SIZES

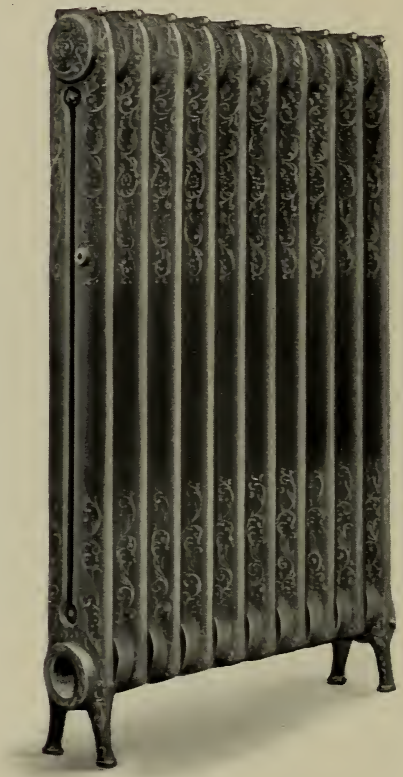
Number of Sections	*Length Inches	Heating Surface			
		20½ Inches Height 5½ Square Feet per Section	16½ Inches Height 4⅔ Square Feet per Section	14½ Inches Height 4 Square Feet per Section	12½ Inches Height 3⅓ Square Feet per Section
2	6	11	9⅓	8	6⅔
3	9	16½	14	12	10
4	12	22	18⅔	16	13⅓
5	15	27½	23⅓	20	16⅔
6	18	33	28	24	20
7	21	38½	32⅔	28	23⅓
8	24	44	37⅓	32	26⅔
9	27	49½	42	36	30
10	30	55	46⅔	40	33⅓
11	33	60½	51⅓	44	36⅔
12	36	66	56	48	40
13	39	71½	60⅔	52	43⅓
14	42	77	65⅓	56	46⅔
15	45	82½	70	60	50
16	48	88	74⅔	64	53⅓
17	51	93½	79⅓	68	56⅔
18	54	99	84	72	60
19	57	104½	88⅔	76	63⅓
20	60	110	93⅓	80	66⅔
21	63	115½	98	84	70
22	66	121	102⅔	88	73⅓
23	69	126½	107⅓	92	76⅔
24	72	132	112	96	80
25	75	137½	116⅔	100	83⅓
26	78	143	121⅓	104	86⅔
27	81	148½	126	108	90
28	84	154	130⅔	112	93⅓
29	87	159½	135⅓	116	96⅔
30	90	165	140	120	100

Above radiators tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
On special order, above radiators can be furnished with screw nipple connections.
*Allow ½ inch for each bushing in estimating length of radiator.

TRITON ONE-COLUMN RADIATORS

ORNAMENTAL

FOR STEAM AND WATER



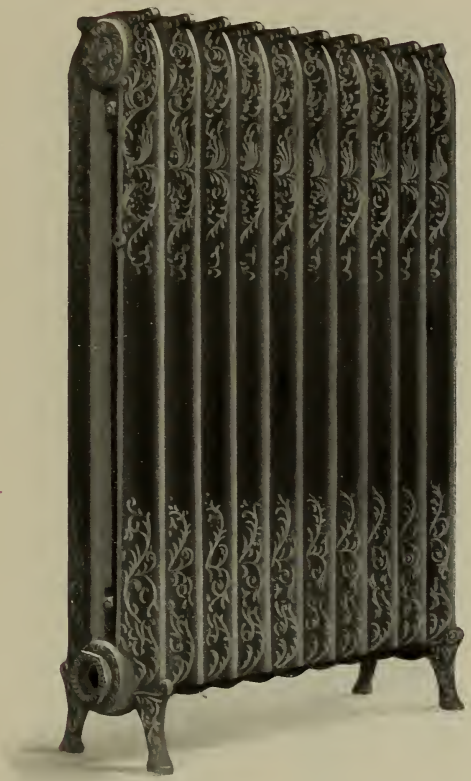
Each section is 4½ inches wide. Width of legs, 5¼ inches.
For list of sizes, heights, tappings, etc., see page 73.
On special order, above radiators can be furnished with screw nipple connections.

THIS pattern of One-Column Radiators is made in the following special forms only: Side Wall for Concealed Brackets, steam and water, page 116; Legs extra high, solid, for steam and water, page 118; Marble Top, for steam and water, page 119.

TRITON TWO-COLUMN RADIATORS

ORNAMENTAL

FOR STEAM AND WATER



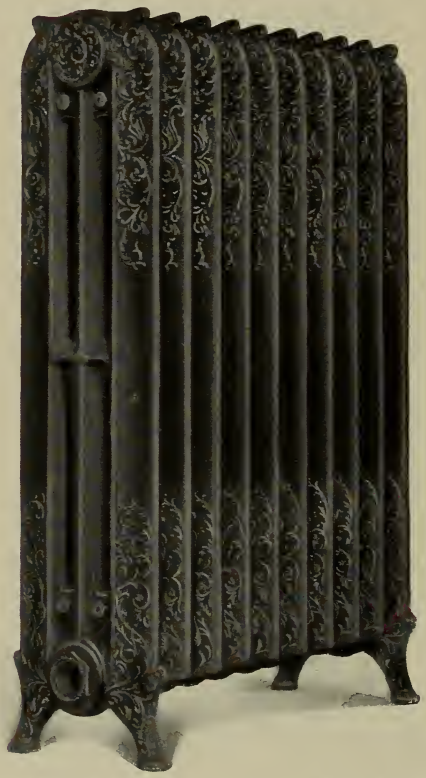
Each section is 7¼ inches wide. Width of legs, 8¼ inches.
For list of sizes, heights, tappings, etc., see page 75.
On special order, above radiators can be furnished with screw nipple connections.

THIS pattern of Two-Column Radiators is made in the following special forms only: Side Wall for Concealed Brackets, steam and water, page 116; Legs extra high, solid (excepting 44-inch heights), for steam and water, page 118; Marble Top, for steam and water, page 119.

TRITON THREE-COLUMN RADIATORS

ORNAMENTAL

FOR STEAM AND WATER



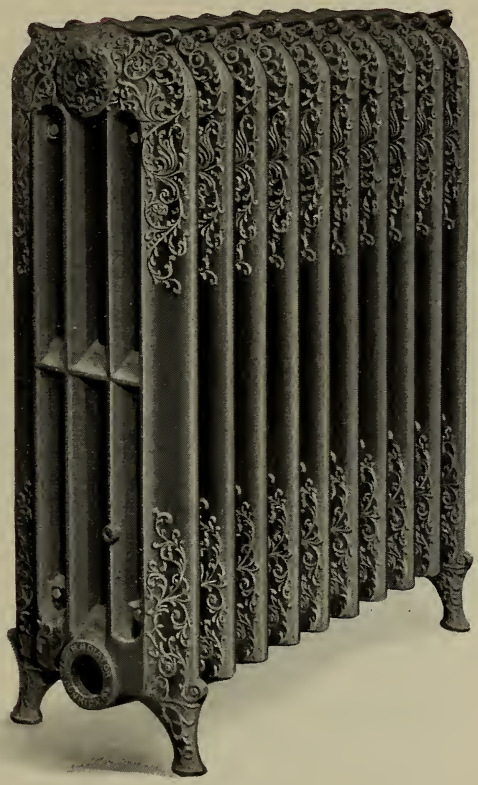
Each section is 9⅛ inches wide. Width of legs, 10⅛ inches.
For list of sizes, heights, tappings, etc., see page 77.
On special order, above radiators can be furnished with screw nipple connections.

THIS pattern of Three-Column Radiators is made in the following special forms only: Side Wall for Concealed Brackets, steam and water, page 116; Legs extra high, solid (excepting 44-inch heights), for steam and water, page 118; Direct-Indirect, for steam and water, page 90; Marble Top, for steam and water, page 119.

TRITON FOUR-COLUMN RADIATORS

ORNAMENTAL

FOR STEAM AND WATER



Each section is 12¾ inches wide. Width of legs, 13¾ inches.
For list of sizes, heights, tappings, etc., see page 79.
On special order, above radiators can be furnished with screw nipple connections.

THIS pattern of Four-Column Radiators is made in the following special forms only: Legs extra high, solid (excepting 44-inch heights), for steam and water, page 118; Marble Top, for steam and water, page 119.

TRITON FIVE-COLUMN RADIATORS

ORNAMENTAL

FOR WINDOW

FOR STEAM AND WATER

Each section is 12¾ inches wide. Width of legs, 12¾ inches.

For list of sizes, heights, tappings, etc., see page 81.

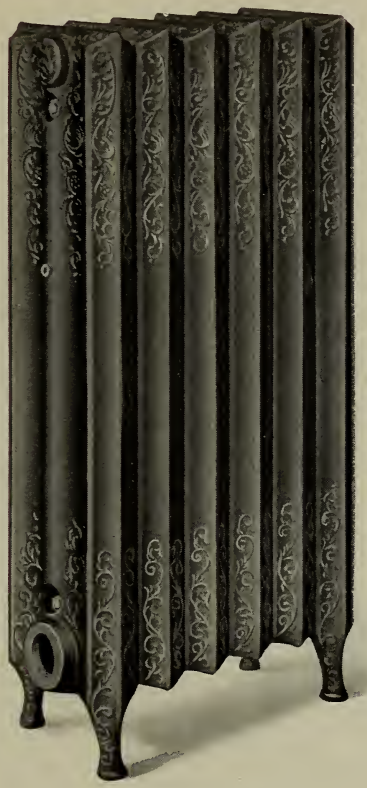
On special order, above radiators can be furnished with screw nipple connections.

THIS pattern of Five-Column Radiators is made in the following special forms only: Legs, extra high solid, for steam and water, page 118.

TRITON FLUE RADIATORS

ORNAMENTAL

FOR STEAM AND WATER



Each section is 9⅛ inches wide. Width of legs, 9⅛ inches.

For list of sizes, heights, tappings, etc., see page 89.

This pattern of radiator is made with screw nipple connections only.

THIS pattern of Triton Flue Radiators is made in the following special forms only: Direct-Indirect for steam and water, page 88.

TRITON FLUE RADIATORS

DIRECT-INDIRECT

FOR STEAM AND WATER

Made in no special forms.

TRITON FLUE RADIATORS

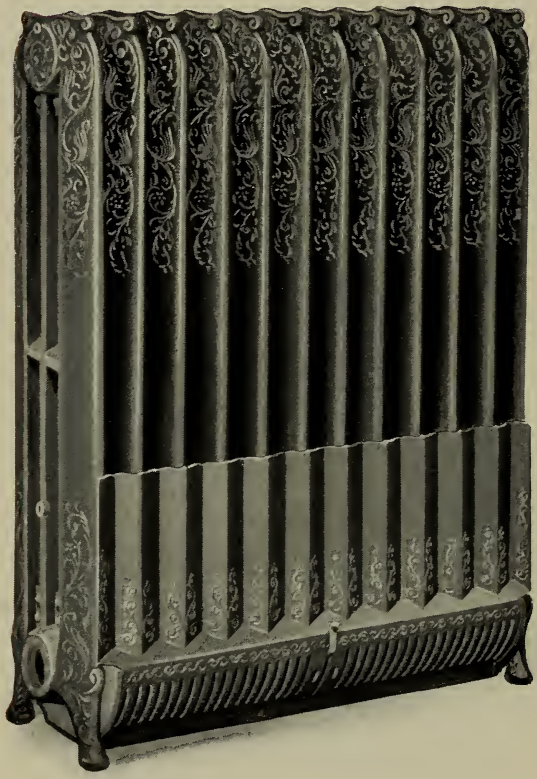
LIST OF SIZES

Number of Sections	*Length Inches	Heating Surface			
		38 Inches Height 7 Square Feet per Section	32 Inches Height 5¾ Square Feet per Section	26 Inches Height 4½ Square Feet per Section	20 Inches Height 3¼ Square Feet per Section
2	6	14	11½	9	6½
3	9	21	17¼	13½	9¾
4	12	28	23	18	13
5	15	35	28¾	22½	16¼
6	18	42	34½	27	19½
7	21	49	40¼	31½	22¾
8	24	56	46	36	26
9	27	63	51¾	40½	29¼
10	30	70	57½	45	32½
11	33	77	63¼	49½	35¾
12	36	84	69	54	39
13	39	91	74¾	58½	42¼
14	42	98	80½	63	45½
15	45	105	86¼	67½	48¾
16	48	112	92	72	52
17	51	119	97¾	76½	55¼
18	54	126	103½	81	58½
19	57	133	109¼	85½	61¾
20	60	140	115	90	65
21	63	147	120¾	94½	68¼
22	66	154	126½	99	71½
23	69	161	132¼	103½	74¾
24	72	168	138	108	78
25	75	175	143¾	112½	81¼
26	78	182	149½	117	84½
27	81	189	155¼	121½	87¾
28	84	196	161	126	91
29	87	203	166¾	130½	94¼
30	90	210	172½	135	97½

Above radiators tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
This pattern of radiators is made with screw nipple connection only.
*Allow ½ inch for each bushing in estimating length of radiator.

TRITON THREE-COLUMN DIRECT-INDIRECT RADIATORS

FOR STEAM AND WATER

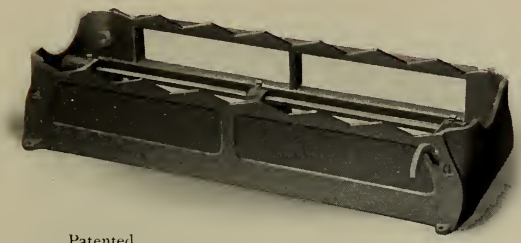


For list of sizes, heights, tappings, etc., see page 77.

With box base applied

TRITON Box Bases are made for use on Ornamental and Plain Three-Column patterns only.

TRITON FLUE BOX BASE



Patented

Bottom of back air inlet is 1 inch above floor. Furnished with back opening only.
For application to radiator, see page 88.

MEASUREMENTS OF TRITON BOX BASES

Outside of back opening flange.

Number of Sections	For Triton Column Radiator Inches	For Triton Flue Radiator Inches	Number of Sections	For Triton Column Radiator Inches	For Triton Flue Radiator Inches
4	$3\frac{5}{16}$ x $5\frac{1}{4}$	$2\frac{11}{16}$ x $3\frac{7}{16}$	9	$3\frac{5}{16}$ x $17\frac{3}{4}$	$2\frac{11}{16}$ x $18\frac{7}{16}$
5	$3\frac{5}{16}$ x $7\frac{3}{4}$	$2\frac{11}{16}$ x $6\frac{7}{16}$	10	$3\frac{5}{16}$ x $20\frac{1}{4}$	$2\frac{11}{16}$ x $21\frac{7}{16}$
6	$3\frac{5}{16}$ x $10\frac{1}{4}$	$2\frac{11}{16}$ x $9\frac{7}{16}$	11	$3\frac{5}{16}$ x $22\frac{3}{4}$	$2\frac{11}{16}$ x $24\frac{7}{16}$
7	$3\frac{5}{16}$ x $12\frac{3}{4}$	$2\frac{11}{16}$ x $12\frac{7}{16}$	12	$3\frac{5}{16}$ x $25\frac{1}{4}$	$2\frac{11}{16}$ x $27\frac{7}{16}$
8	$3\frac{5}{16}$ x $15\frac{1}{4}$	$2\frac{11}{16}$ x $15\frac{7}{16}$			

All orders for Three-column Box Base Radiators should clearly state whether back or bottom air inlet is required. Back opening will be furnished unless otherwise ordered.

An eleven-section Base is used on eleven or more odd numbers of sections and a twelve-section Base is used on twelve or more even numbers of sections.

TRITON THREE-COLUMN BOX BASE

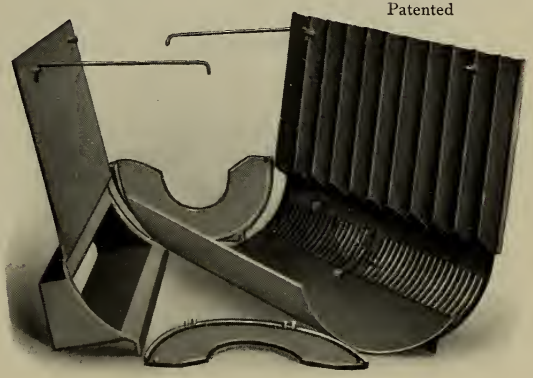
Bottom of back air inlet opening is ½ inch above floor.

The damper arrangement of this is such that when cold air is brought through the floor, separate floor dampers are not required. Make floor opening same size as for wall opening.

Distance from floor to top of Base, 15 inches. For Wall Box, see page 108.

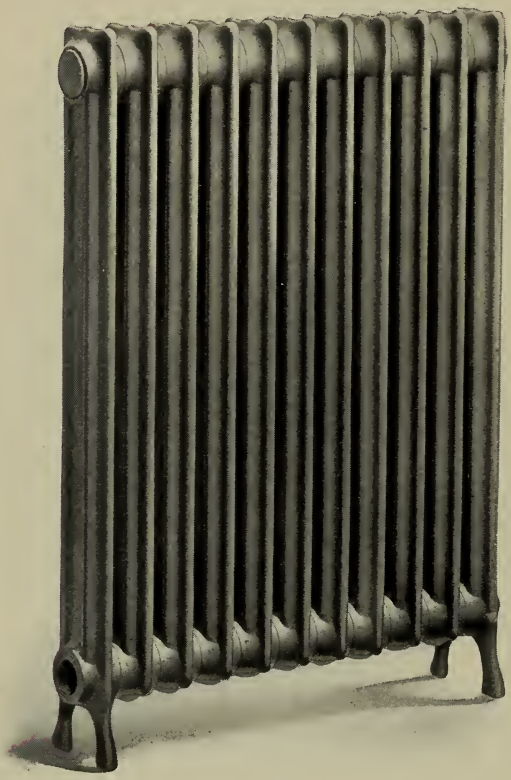
For measurements, see above table.

Patented



GRECIAN ONE-COLUMN RADIATORS

FOR STEAM AND WATER



Each section is 4½ inches wide. Width of legs, 5 inches.

THIS pattern of One-Column Radiators is made in the following special forms: Angle, Corner, Curved and Circular, for steam and water, pages 111, 112 and 113; Window, for steam, page 114; Stairway, for steam, page 115; Legs extra high, solid, for steam and water, page 118; Side Wall for Concealed Brackets, steam and water, page 116; Marble Top, for steam and water, page 119.

GRECIAN ONE-COLUMN RADIATORS

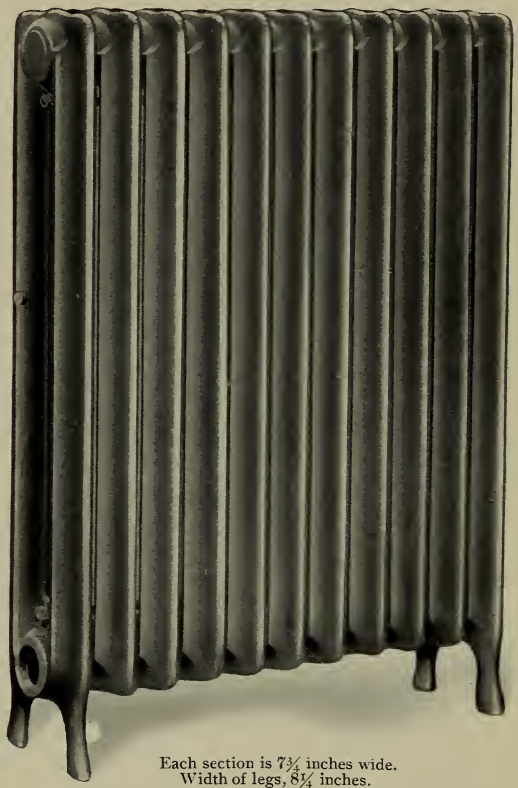
LIST OF SIZES

Number of Sections	*Length Inches	Heating Surface				
		38 Inches Height 3 Square Feet per Section	32 Inches Height 2½ Square Feet per Section	26 Inches Height 2 Square Feet per Section	23 Inches Height 1⅔ Square Feet per Section	20 Inches Height 1½ Square Feet per Section
2	5	6	5	4	3⅓	3
3	7½	9	7½	6	5	4½
4	10	12	10	8	6⅔	6
5	12½	15	12½	10	8⅓	7½
6	15	18	15	12	10	9
7	17½	21	17½	14	11⅔	10½
8	20	24	20	16	13⅓	12
9	22½	27	22½	18	15	13½
10	25	30	25	20	16⅔	15
11	27½	33	27½	22	18⅓	16½
12	30	36	30	24	20	18
13	32½	39	32½	26	21⅔	19½
14	35	42	35	28	23⅓	21
15	37½	45	37½	30	25	22½
16	40	48	40	32	26⅔	24
17	42½	51	42½	34	28⅓	25½
18	45	54	45	36	30	27
19	47½	57	47½	38	31⅔	28½
20	50	60	50	40	33⅓	30
21	52½	63	52½	42	35	31½
22	55	66	55	44	36⅔	33
23	57½	69	57½	46	38⅓	34½
24	60	72	60	48	40	36
25	62½	75	62½	50	41⅔	37½
26	65	78	65	52	43⅓	39
27	67½	81	67½	54	45	40½
28	70	84	70	56	46⅔	42
29	72½	87	72½	58	48⅓	43½
30	75	90	75	60	50	45

Above radiators are tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
On special order, above radiators can be furnished with screw nipple connections.
*Allow ½ inch for each bushing in estimating length of radiators.

GRECIAN TWO-COLUMN RADIATORS

FOR STEAM AND WATER



Each section is 7¾ inches wide.
Width of legs, 8¼ inches.

THIS pattern of Two-Column Radiators is made in the following special forms only: Angle, Corner, Curved and Circular, for steam and water, pages 111, 112 and 113; Window, for steam, page 114; Stairway, for steam, page 115; Legs extra high, solid (excepting 45-inch heights), for steam and water, page 118; Side Wall for Concealed Brackets, steam and water, page 116; Direct-Indirect, for steam and water, page 106; Marble Top, for steam and water, page 119.

GRECIAN TWO-COLUMN RADIATORS

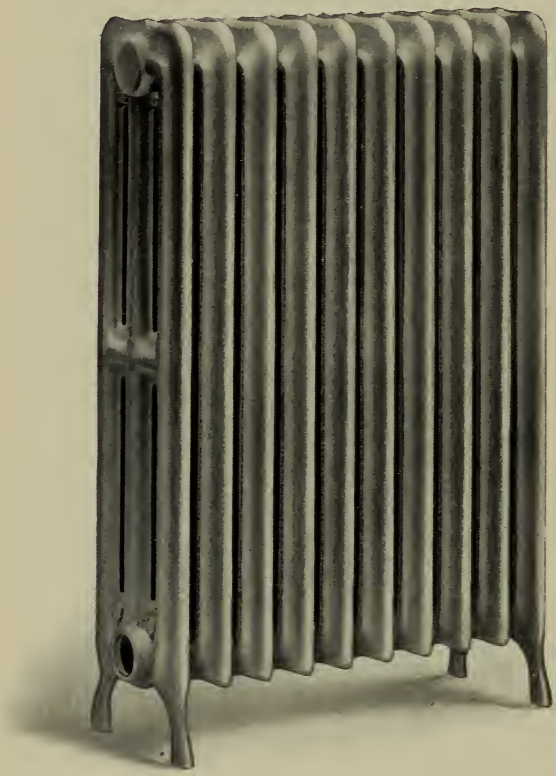
LIST OF SIZES

Number of Sections	*Length 2½ Inches per Section	Heating Surface					
		45 Inches Height 5 Square Feet per Section	38 Inches Height 4 Square Feet per Section	32 Inches Height 3⅓ Square Feet per Section	26 Inches Height 2⅔ Square Feet per Section	23 Inches Height 2⅓ Square Feet per Section	20 Inches Height 2 Square Feet per Section
2	5	10	8	6⅔	5⅓	4⅔	4
3	7½	15	12	10	8	7	6
4	10	20	16	13⅓	10⅔	9⅓	8
5	12½	25	20	16⅔	13⅓	11⅔	10
6	15	30	24	20	16	14	12
7	17½	35	28	23⅓	18⅔	16⅓	14
8	20	40	32	26⅔	21⅓	18⅔	16
9	22½	45	36	30	24	21	18
10	25	50	40	33⅓	26⅔	23⅓	20
11	27½	55	44	36⅔	29⅓	25⅔	22
12	30	60	48	40	32	28	24
13	32½	65	52	43⅓	34⅔	30⅓	26
14	35	70	56	46⅔	37⅓	32⅔	28
15	37½	75	60	50	40	35	30
16	40	80	64	53⅓	42⅔	37⅓	32
17	42½	85	68	56⅔	45⅓	39⅔	34
18	45	90	72	60	48	42	36
19	47½	95	76	63⅓	50⅔	44⅓	38
20	50	100	80	66⅔	53⅓	46⅔	40
21	52½	105	84	70	56	49	42
22	55	110	88	73⅓	58⅔	51⅓	44
23	57½	115	92	76⅔	61⅓	53⅔	46
24	60	120	96	80	64	56	48
25	62½	125	100	83⅓	66⅔	58⅓	50
26	65	130	104	86⅔	69⅓	60⅔	52
27	67½	135	108	90	72	63	54
28	70	140	112	93⅓	74⅔	65⅓	56
29	72½	145	116	96⅔	77⅓	67⅔	58
30	75	150	120	100	80	70	60

Above radiators are tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
On special order, above radiators can be furnished with screw nipple connections.
*Allow ½ inch for each bushing in estimating length of radiators.

GRECIAN THREE-COLUMN RADIATORS

FOR STEAM AND WATER



Each section is 9 inches wide. Width of legs, 9¾ inches.

THIS pattern of Three-Column Radiators is made in the following special forms only: Angle, Corner, Curved and Circular, for steam and water, pages 111, 112 and 113; Window, for steam, page 114; Stairway, for steam, page 115; Legs extra high, solid (excepting 45-inch heights), for steam and water, page 118; Side Wall for Concealed Brackets, steam and water, page 116; Direct-Indirect, for steam and water, page 106; Marble Top, for steam and water, page 119.

GRECIAN THREE-COLUMN RADIATORS

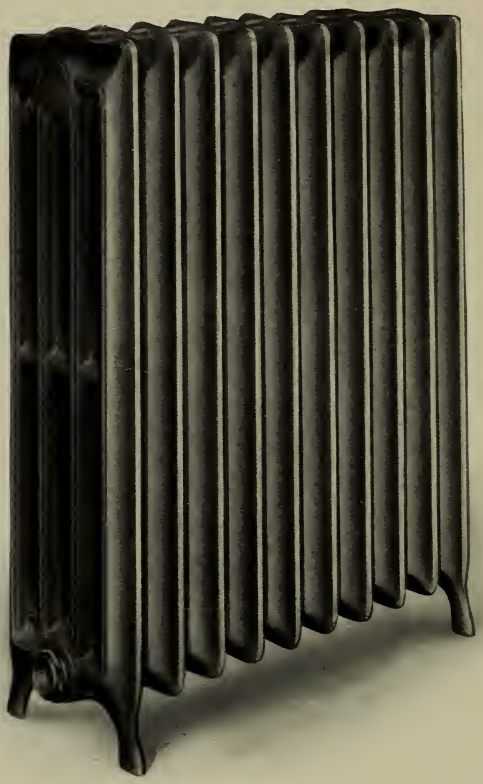
LIST OF SIZES

Number of Sections	*Length 2½ Inches per Section	Heating Surface					
		45 Inches Height 6 Square Feet per Section	38 Inches Height 5 Square Feet per Section	32 Inches Height 4½ Square Feet per Section	26 Inches Height 3¾ Square Feet per Section	23 Inches Height 3¼ Square Feet per Section	20 Inches Height 2¾ Square Feet per Section
2	5	12	10	9	7½	6½	5½
3	7½	18	15	13½	11¼	9¾	8¼
4	10	24	20	18	15	13	11
5	12½	30	25	22½	18¾	16¼	13¾
6	15	36	30	27	22½	19½	16½
7	17½	42	35	31½	26¼	22¾	19¼
8	20	48	40	36	30	26	22
9	22½	54	45	40½	33¾	29¼	24¾
10	25	60	50	45	37½	32½	27½
11	27½	66	55	49½	41¼	35¾	30¼
12	30	72	60	54	45	39	33
13	32½	78	65	58½	48¾	42¼	35¾
14	35	84	70	63	52½	45½	38½
15	37½	90	75	67½	56¼	48¾	41¼
16	40	96	80	72	60	52	44
17	42½	102	85	76½	63¾	55¼	46¾
18	45	108	90	81	67½	58½	49½
19	47½	114	95	85½	71¼	61¾	52¼
20	50	120	100	90	75	65	55
21	52½	126	105	94½	78¾	68¼	57¾
22	55	132	110	99	82½	71½	60½
23	57½	138	115	103½	86¼	74¾	63¼
24	60	144	120	108	90	78	66
25	62½	150	125	112½	93¾	81¼	68¾
26	65	156	130	117	97½	84½	71½
27	67½	162	135	121½	101¼	87¾	74¼
28	70	168	140	126	105	91	77
29	72½	174	145	130½	108¾	94¼	79¾
30	75	180	150	135	112½	97½	82½

Above radiators are tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
On special order, above radiators can be furnished with screw nipple connections.
* Allow ½ inch for each bushing in estimating length of radiators.

GRECIAN FOUR-COLUMN RADIATORS

FOR STEAM AND WATER



Each section is 11 inches wide. Width of legs, 11¾ inches.

THIS pattern of Four-Column Radiators is made in the following special forms only: Legs extra high, solid (excepting 45-inch heights), for steam and water, page 118; Side Wall for Concealed Brackets, steam and water, page 116; Direct-Indirect, for steam or water, page 106; Marble Top, for steam and water, page 119.

GRECIAN FOUR-COLUMN RADIATORS

LIST OF SIZES

Number of Sections	*Length 3 Inches per Section	Heating Surface					
		45 Inches Height 10 Square Feet per Section	38 Inches Height 8 Square Feet per Section	32 Inches Height 6½ Square Feet per Section	26 Inches Height 5 Square Feet per Section	23 Inches Height 4¼ Square Feet per Section	20 Inches Height 3½ Square Feet per Section
2	6	20	16	13	10	8½	7
3	9	30	24	19½	15	12¾	10½
4	12	40	32	26	20	17	14
5	15	50	40	32½	25	21¼	17½
6	18	60	48	39	30	25½	21
7	21	70	56	45½	35	29¾	24½
8	24	80	64	52	40	34	28
9	27	90	72	58½	45	38¼	31½
10	30	100	80	65	50	42½	35
11	33	110	88	71½	55	46¾	38½
12	36	120	96	78	60	51	42
13	39	130	104	84½	65	55¼	45½
14	42	140	112	91	70	59½	49
15	45	150	120	97½	75	63¾	52½
16	48	160	128	104	80	68	56
17	51	170	136	110½	85	72¼	59½
18	54	180	144	117	90	76½	63
19	57	190	152	123½	95	80¾	66½
20	60	200	160	130	100	85	70
21	63	210	168	136½	105	89¼	73½
22	66	220	176	143	110	93½	77
23	69	230	184	149½	115	97¾	80½
24	72	240	192	156	120	102	84
25	75	250	200	162½	125	106¼	87½
26	78	260	208	169	130	110½	91
27	81	270	216	175½	135	114¾	94½
28	84	280	224	182	140	119	98
29	87	290	232	188½	145	123¼	101½
30	90	300	240	195	150	127½	105

Above radiators tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
On special order, above radiators can be furnished with screw nipple connections.
* Allow ½-inch for each bushing in estimating length of radiators.

SUN TWO-COLUMN RADIATORS

FOR STEAM AND WATER

Each section is 7¾ inches wide. Width of legs, 8¼ inches.

THIS pattern of Two-Column Radiators is made in the following special forms: Angle, Corner, Curved and Circular, for steam and water, pages 111, 112 and 113; Window, for steam, page 114; Stairway, for steam, page 115; Legs extra high, solid (excepting 45-inch heights), for steam and water, page 118; Side Wall for Concealed Brackets, steam and water, page 116; Direct-Indirect, for steam and water, page 106; Marble Top, for steam and water, page 119.

SUN TWO-COLUMN RADIATORS

LIST OF SIZES

Number of Sections	*Length 2½ Inches per Section	Heating Surface					
		45 Inches Height 5 Square Feet per Section	38 Inches Height 4 Square Feet per Section	32 Inches Height 3⅓ Square Feet per Section	26 Inches Height 2⅔ Square Feet per Section	23 Inches Height 2⅓ Square Feet per Section	20 Inches Height 2 Square Feet per Section
2	5	10	8	6⅔	5⅓	4⅔	4
3	7½	15	12	10	8	7	6
4	10	20	16	13⅓	10⅔	9⅓	8
5	12½	25	20	16⅔	13⅓	11⅔	10
6	15	30	24	20	16	14	12
7	17½	35	28	23⅓	18⅔	16⅓	14
8	20	40	32	26⅔	21⅓	18⅔	16
9	22½	45	36	30	24	21	18
10	25	50	40	33⅓	26⅔	23⅓	20
11	27½	55	44	36⅔	29⅓	25⅔	22
12	30	60	48	40	32	28	24
13	32½	65	52	43⅓	34⅔	30⅓	26
14	35	70	56	46⅔	37⅓	32⅔	28
15	37½	75	60	50	40	35	30
16	40	80	64	53⅓	42⅔	37⅓	32
17	42½	85	68	56⅔	45⅓	39⅔	34
18	45	90	72	60	48	42	36
19	47½	95	76	63⅓	50⅔	44⅓	38
20	50	100	80	66⅔	53⅓	46⅔	40
21	52½	105	84	70	56	49	42
22	55	110	88	73⅓	58⅔	51⅓	44
23	57½	115	92	76⅔	61⅓	53⅔	46
24	60	120	96	80	64	56	48
25	62½	125	100	83⅓	66⅔	58⅓	50
26	65	130	104	86⅔	69⅓	60⅔	52
27	67½	135	108	90	72	63	54
28	70	140	112	93⅓	74⅔	65⅓	56
29	72½	145	116	96⅔	77⅓	67⅔	58
30	75	150	120	100	80	70	60

Above radiators are tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
On special order, above radiators can be furnished with screw nipple connections.
*Allow ½ inch for each bushing in estimating length of radiators.

SUN THREE-COLUMN RADIATORS

FOR STEAM AND WATER

Each section is 9 inches wide. Width of legs, 9½ inches.

THIS pattern of Three-Column Radiators is made in the following special forms: Angle, Corner, Curved and Circular, for steam and water, pages 111, 112 and 113; Window, for steam, page 114; Stairway, for steam, page 115; Legs extra high, solid (except 45-inch heights), for steam and water, page 118; Side Wall for Concealed Brackets, steam and water, page 116; Direct-Indirect, for steam and water, page 106; Marble Top, for steam and water, page 119.

SUN THREE-COLUMN RADIATORS

LIST OF SIZES

Number of Sections	*Length 2½ Inches per Section	Heating Surface					
		45 Inches Height 6 Square Feet per Section	38 Inches Height 5 Square Feet per Section	32 Inches Height 4½ Square Feet per Section	26 Inches Height 3¾ Square Feet per Section	23 Inches Height 3¼ Square Feet per Section	20 Inches Height 2¾ Square per Feet Section
2	5	12	10	9	7½	6½	5½
3	7½	18	15	13½	11¼	9¾	8¼
4	10	24	20	18	15	13	11
5	12½	30	25	22½	18¾	16¼	13¾
6	15	36	30	27	22½	19½	16½
7	17½	42	35	31½	26¼	22¾	19¼
8	20	48	40	36	30	26	22
9	22½	54	45	40½	33¾	29¼	24¾
10	25	60	50	45	37½	32½	27½
11	27½	66	55	49½	41¼	35¾	30¼
12	30	72	60	54	45	39	33
13	32½	78	65	58½	48¾	42¼	35¾
14	35	84	70	63	52½	45½	38½
15	37½	90	75	67½	56¼	48¾	41¼
16	40	96	80	72	60	52	44
17	42½	102	85	76½	63¾	55¼	46¾
18	45	108	90	81	67½	58½	49½
19	47½	114	95	85½	71¼	61¾	52¼
20	50	120	100	90	75	65	55
21	52½	126	105	94½	78¾	68¼	57¾
22	55	132	110	99	82½	71½	60½
23	57½	138	115	103½	86¼	74¾	63¼
24	60	144	120	108	90	78	66
25	62½	150	125	112½	93¾	81¼	68¾
26	65	156	130	117	97½	84½	71½
27	67½	162	135	121½	101¼	87¾	74¼
28	70	168	140	126	105	91	77
29	72½	174	145	130½	108¾	94¼	79¾
30	75	180	150	135	112½	97½	82½

Above radiators are tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
On special order, above radiators can be furnished with screw nipple connections.
*Allow ½ inch for each bushing in estimating length of radiator.

UTILITY RADIATORS

FOR WINDOW

FOR STEAM AND WATER

Each section is 11¼ inches wide. Width of legs, 11¼ inches.

THIS pattern of Six-Column Radiators is made in the following special forms only: Legs extra high, solid, for steam and water, page 118; Curved or Angle, for steam and water, page 111; Marble Top, for steam and water, page 119.

UTILITY RADIATORS

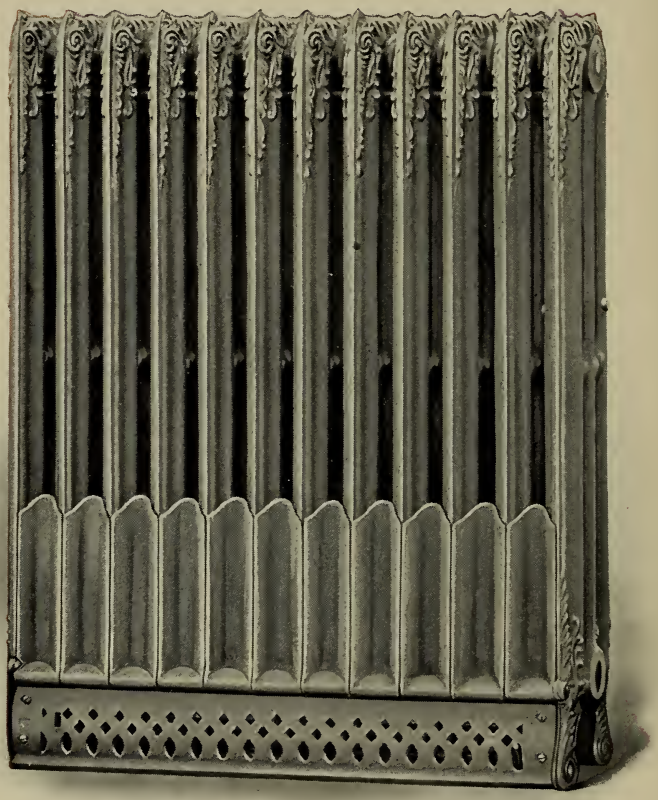
LIST OF SIZES

Number of Sections	*Length 3 Inches per Section	Heating Surface			
		26 Inches Height 7 Square Feet per Section	22 Inches Height 6 Square Feet per Section	18 Inches Height 5 Square Feet per Section	14 Inches Height 4 Square Feet per Section
2	6	14	12	10	8
3	9	21	18	15	12
4	12	28	24	20	16
5	15	35	30	25	20
6	18	42	36	30	24
7	21	49	42	35	28
8	24	56	48	40	32
9	27	63	54	45	36
10	30	70	60	50	40
11	33	77	66	55	44
12	36	84	72	60	48
13	39	91	78	65	52
14	42	98	84	70	56
15	45	105	90	75	60
16	48	112	96	80	64
17	51	119	102	85	68
18	54	126	108	90	72
19	57	133	114	95	76
20	60	140	120	100	80
21	63	147	126	105	84
22	66	154	132	110	88
23	69	161	138	115	92
24	72	168	144	120	96
25	75	175	150	125	100
26	78	182	156	130	104
27	81	189	162	135	108
28	84	196	168	140	112
29	87	203	174	145	116
30	90	210	180	150	120

Above radiators are tapped 2 inches and bushed as per list on page 121.
Distance from floor to center of tapping, page 120.
On special order, above radiators can be furnished with screw nipple connections.
*Allow ½ inch for each bushing in estimating length of radiator.

SUN AND GRECIAN DIRECT-INDIRECT RADIATORS

FOR STEAM AND WATER



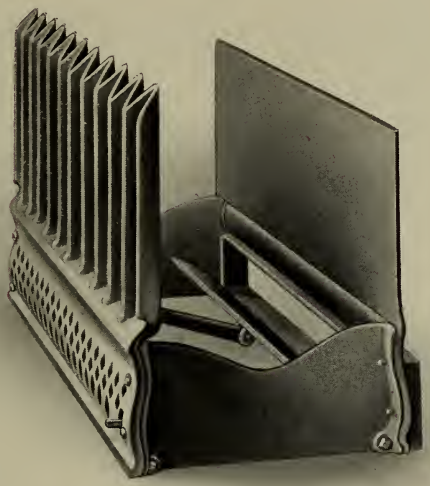
Sun Radiator with box base applied

SUN Box Bases are made for use on Sun Two and Three-Column and Grecian Two, Three and Four-Column Radiators of all heights.

Made at West Newton plant

DIRECT-INDIRECT BOX BASE

FOR SUN AND GRECIAN RADIATORS



OUTSIDE DIMENSIONS OF BACK OPENING FLANGE

Number of Sections	Size, Inches	Number of Sections	Size, Inches
5	3¼ x 8½	9	3¼ x 16½
6	3¼ x 8½	10	3¼ x 17½
7	3¼ x 12½	11	3¼ x 17½
8	3¼ x 12½	12 to 17	3¼ x 21¾

Bottom of each back air inlet opening is 1 inch above floor.

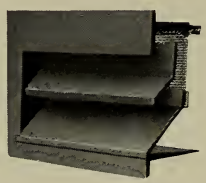
An eleven-section Base is used on eleven or more odd numbers of sections and a twelve-section Base is used on twelve or more even number of sections.

Box Bases with back or bottom air inlet can be furnished, but unless otherwise ordered, Base with back air inlet will be shipped. If bottom air inlet is required state whether floor dampers are wanted.

For Wall Box, see page 108.

WALL BOXES

THE main part of Box is constructed in one piece, which with angle slats in place, makes it water-tight and durable. A heavy copper screen is firmly held in position at back of box, making it insect proof.



CROSS SECTION

From front flange to back of box, 2½ inches; size of opening in brickwork, 17¼ x 5⅛ inches; size of collar for galvanized iron, 17 x 4⅞ inches.

SUN DINING-ROOM RADIATORS

FOR STEAM AND WATER

Number	Length in Inches	Heating Surface Square Feet	Price for Water	Price for Steam
1	30	43½	$50.00	$46.00
2	35	54½	55.00	50.00
3	40	65½	60.00	54.00
4	45	76½	65.00	58.00
5	50	87½	70.00	62.00
6	55	98½	75.00	66.00
7	60	109½	80.00	70.00
8	65	120½	85.00	74.00
9	70	131½	90.00	78.00
10	75	142½	95.00	82.00

Made in Sun Three-Column pattern only. Ovens are all the same size, 24x11x16 inches. Height of radiator complete, 38½ inches.
Distance from back of oven to center of radiator tappings, 5¾ inches.
For additional measurements, see page 102.

ATHENIAN PANTRY RADIATOR

FOR STEAM AND WATER

THIS pattern of radiator is useful for pantries, restaurants, dining-rooms and any place where heat is required, and the additional service of plate warming needed. It is made up from seven-foot size only, of Athenian wall sections.

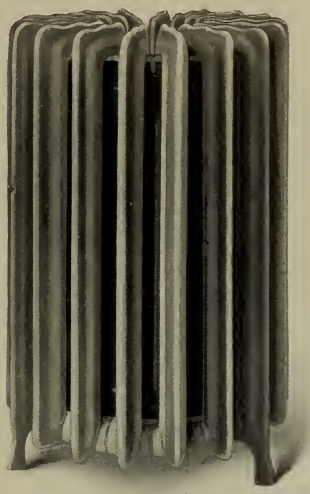
The radiator may be constructed from one to five sections high as follows:

Number	Height Inches	Heating Surface Feet	List Price
1	7	7	$8.00
2	17	15	15.00
3	27	23	22.00
4	37	30	29.00
5	47	39	36.00

Length, 24¼ inches. Width, 13¼ inches.

CIRCULAR RADIATORS

FOR STEAM AND WATER



DIMENSIONS

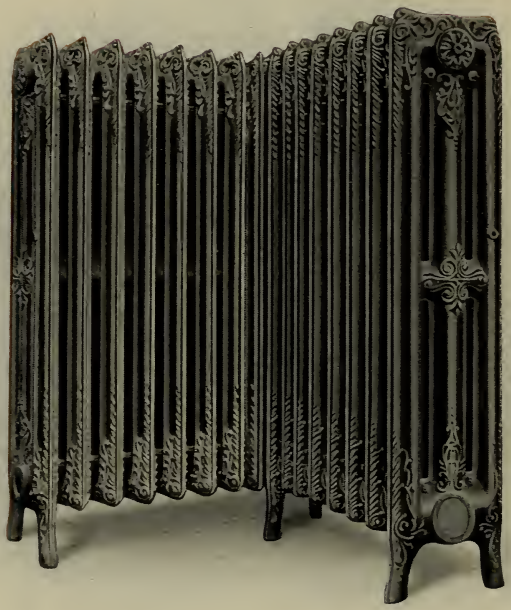
One-column			Two-column			Three-column		
Number of Sections	Inside Diam. at Legs	Outside Diam. at Legs	Number of Sections	Inside Diam. at Legs	Outside Diam. at Legs	Number of Sections	Inside Diam. at Legs	Outside Diam. at Legs
12	5 3/8	15 5/8	16	6 1/2	23 1/2	16	4 1/2	25
14	6 11/16	16 15/16	18	8 1/2	25 1/2	18	6 1/2	27
16	8 1/16	18 5/16	20	10 1/4	27 1/4	20	8 1/4	28 3/4
18	9 3/8	19 5/8	22	12 1/4	29 1/4	22	10 1/4	30 3/4
20	10 11/16	20 15/16	24	14 1/2	31	24	11 1/2	32 1/2
22	12 1/16	22 5/16	26	15 1/2	32 1/2	26	12 3/4	33 1/4
24	13 7/16	23 11/16	28	17	34	28	14 1/2	35
26	14 3/4	25	30	18 1/2	35 1/2	30	16 1/4	36 3/4
28	16 1/8	26 3/8	32	20	37	32	18	38 1/2
30	17 7/16	27 11/16	34	21 1/2	38 1/2	34	19 3/4	40 1/4
32	18 13/16	29 1/16	36	22 1/4	39 1/4	36	21 1/2	42
34	20 3/16	30 7/16	38	25	42	38	23 1/4	43 3/4
36	21 1/2	31 3/4	40	26 1/2	43 1/2	..	. . .	. . .

Circular and Column Radiators are made in all heights of Grecian One, Two and Three, and Sun Two and Three-Column patterns. No less number of sections than given in list above can be used to form a complete circle. In ordering, always state whether radiator is to fit around a column, as Circular Radiators are generally made in one piece, and Column Radiators in two pieces; Marble Top can also be furnished if desired. About four weeks are required to make and ship above radiators.

Circular or Column Radiators cannot be tapped larger than 1½ inches.

CORNER RADIATORS

FOR STEAM AND WATER



FOUR sections are needed to turn a corner (excepting Utility, which requires six), and as many regular sections may be added as desired.

Made in regular heights of Grecian, Sun and Utility Radiators.

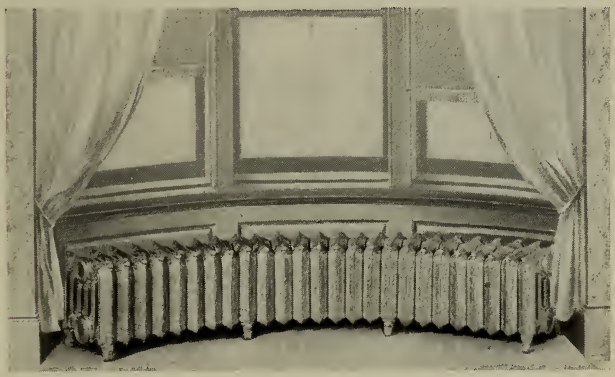
Space occupied by the four-corner sections each way from the corner of the room:

10½ inches for One-Column Radiators
12 inches for Two-Column Radiators
12½ inches for Three-Column Radiators
20½ inches for the Utility Radiators

In ordering Corner Radiators, always state which is the feed end as you face the radiator when in position, as illustrated above.

ANGLE AND CURVED RADIATORS

ARRANGED for a bay window, either with or without a seat. Can be made any size to suit the room. Angle Radiators having three sides will be split in the center and each Angle shipped separately. The two Angles can be assembled on the job.

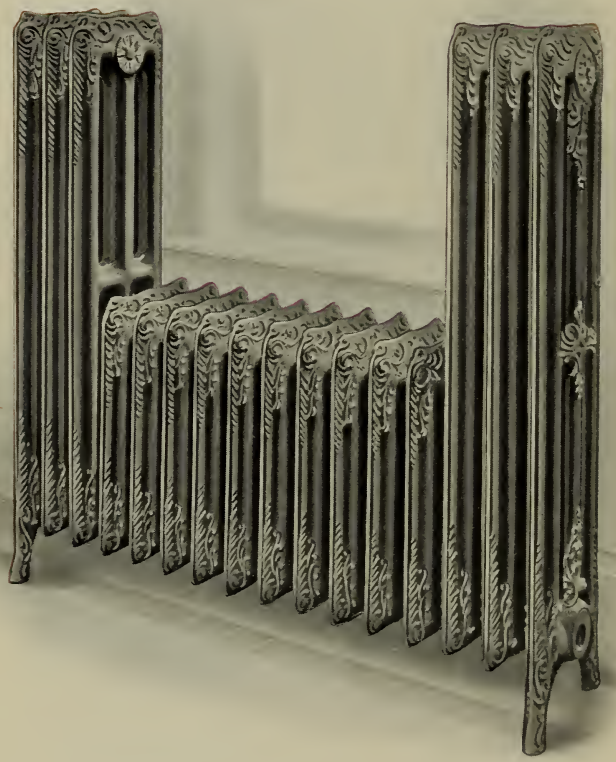


ANGLE and Curved Radiators are made for steam and water, in Grecian, Sun and Utility patterns only, at West Newton plant.

With each order for Angle or Curved Radiators a heavy paper template should be sent, showing the exact angle or curve of wall at floor line. Also state which is feed end, right or left hand, as you face the radiator, when in position. Tappings are made 2 inches and bushed per list on page 121. From three to four weeks' time is required to make and ship above radiators.

WINDOW RADIATORS

FOR STEAM ONLY



MADE in Grecian One, Two and Three-Column, and Sun Two and Three-Column Radiators.

STAIRWAY RADIATORS

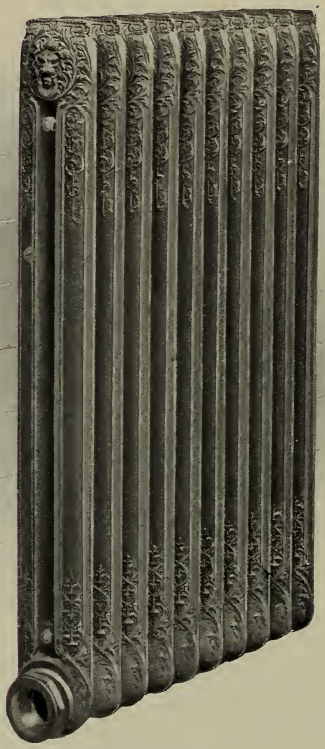
FOR STEAM ONLY

MADE in Grecian One, Two and Three-Column, and Sun Two and Three-Column Radiators.

COLUMN WALL RADIATORS

With Concealed Brackets

FOR STEAM AND WATER



ABOVE illustration is representative of the Side Wall pattern of Florentine and Puritan One, Two, Three and Four-Column; Triton, Ornamental and Plain, One, Two and Three-Column; Sun Two and Three-Column, and Grecian One, Two, Three and Four-Column Radiators.

List of sizes, heights, tappings, etc., same as the several styles referred to above.

CONCEALED RADIATOR BRACKETS

FOR TRITON RADIATORS

Made to support One, Two and Three-Column Triton Ornamental and Plain Radiators.

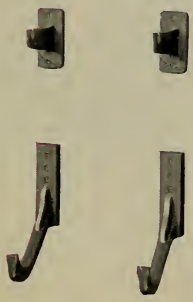
Made at Dunkirk plant

FOR PURITAN AND FLORENTINE RADIATORS

Made to support One, Two, Three and Four-Column Puritan and Florentine Radiators.

Made at Detroit plant

FOR GRECIAN AND SUN RADIATORS



Made to support One, Two, Three and Four-Column Grecian and Two and Three-Column Sun Radiators.

Made at West Newton plant

High Detachable Legs

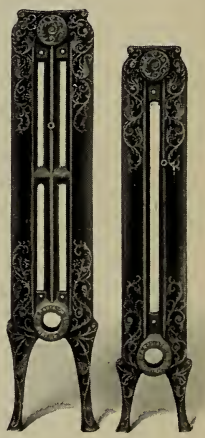
EXTRA HIGH LEGS

ON special order, extra high detachable legs can be furnished on Puritan and Florentine radiators *only*, making the height from floor to center of tappings for water and one or two pipe-steam as follows:

One, Two and Three-Column,	5½ or 7½	inches
Four-Column . . .	6 or 8	inches
Five-Column . . .	5 or 7	inches

When ordering, mention height wanted from floor to center of supply tapping and whether for one or two-pipe work, when for steam.

ON special order only, all styles of our radiators (except 44 and 45-inch heights) can be furnished with extra high solid legs, making the distance from floor to center of tappings 6 or 8 inches.



Note—In ordering radiators having Extra High Solid Legs, always give distance of required height from floor to center of supply tapping; and whether for one or two pipe-work, when for steam.

High leg sections are made without drop hub.

MARBLE TOPS

ALL styles of Column Radiators listed herein can be furnished with lugs or dowel pins on top of leg sections, for holding Marble Tops.

ADJUSTABLE FEET

CONSIST of two iron blocks that open by turning the top piece which is so cast that any radiator foot will fit securely. Adjustment can be made with the screw, which holds the two pieces in place. They can be used on any kind of fixture that must stand level. Furnished in plain iron and can be bronzed to correspond to fixture upon them.

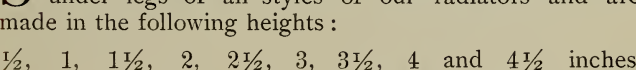
No. 1 extends 7/8 to 1¼ inches, price each . . .	$0.20
No. 2 extends 1¼ to 1¾ inches, price each . . .	.25
No. 3 extends 1⅜ to 2¼ inches, price each . . .	.30

PEDESTALS

SOLID cast-iron pedestals can be furnished for placing under legs of all styles of our radiators and are made in the following heights:

½, 1, 1½, 2, 2½, 3, 3½, 4 and 4½ inches.

CAPITOL RADIATOR WRENCHES



MADE to fit all United States Radiator screw nipples, which have two lugs on inside so that flattened end of wrench can be applied and the nipple unscrewed or tightened. Price each, $2.50.

SPECIAL DATA ON UNITED STATES RADIATORS

MEASUREMENTS OF SECTIONS AND TAPPINGS

Style		Dimensions of Sections			Distance from Floor to Center of Tapping		Distance from Floor to Center of Upper Tappings												
		Width In.	Width Legs In.	Thickness In.	Water and Steam Supply and Return, In.		45 In.	44 In.	38 In.	32 In.	26 In.	23 In.	22 In.	20½ In.	20 In.	18 In.	17 In.	16½ In.	14½ In.	14 In.	12½ In.
					Slip Nipple	Screw Nipple															
Puritan and Florentine	One-column	4½	5½	2½	4				35½	29½	23½		19¾			15¾					
	Two-column	7⅛	8⅛	2½	4	4½	42¼		35½	29½	23½		19¾			15¾					
	Three-column	9⅛	9 5/16	2½	4	4½		41½	35½	29½	23½		19¾			15¾					
	Four-column	12½	13½	2¾	4½			41½	35½	29½	23½		19¾			15¾					
	Five-column	13	13	3	3½										18		15			12	
Triton Plain and Ornamental	One-column	4½	5¼	2½	4¼	4⅞			35½	29⅝	23⅝	20⅝			17⅝						
	Two-column	7¼	8¼	2½	4¼	4⅞		41½	35 7/16	29⅝	23⅝	20⅝			17⅝						
	Three-column	9⅛	10⅛	2½	4¼	4⅞		40⅞	35 1/16	29 1/16	23⅞	20 11/16			17⅞	15⅞					
	Four-column	12¾	13¾	3	4⅛	4¾		40⅞	35⅛	29 1/16	23 5/16	20¼			16 1/16	15¼					
	Five-column	12¾	12¾	3	3	3								18½					14⅝	12¾	10¼
	Flue	9⅛	9⅛	3		5½			30¾	24 1/16	18⅝				12 13/16						
Grecian and Sun	One-column	4½	5	2½	4½	5			35¼	29¼	23¼	20¼			17¼						
	Two-column	7¾	8¼	2½	4½	5	42¼		35¼	29¼	23¼	20¼			17¼						
	Three-column	9	9¾	2½	4½	5	42¼		35¼	29¼	23¼	20¼			17¼						
	Four-column	11	11¾	3	4½	5	42¼		35¼	29¼	23¼	20¼			17¼						
Utility	Six-column	11¾	11¼	3	3½	3½					24		20			16				12	

Allow ½ inch for each bushing in estimating length of radiators.

RADIATOR TAPPING LIST

STEAM

ONE-PIPE WORK

Radiators containing 24 square feet and under	1 inch
Above 24, but not exceeding 60 square feet	1¼ inch
Above 60, but not exceeding 100 square feet	1½ inch
Above 100 square feet	2 inch

TWO-PIPE WORK

Radiators containing 48 square feet and under	1 x ¾ inch
Above 48, but not exceeding 96 square feet	1¼ x 1 inch
Above 96 square feet	1½ x 1¼ inch

WATER

TAPPED FOR SUPPLY AND RETURN

Radiators containing 40 square feet and under	1 inch
Above 40, but not exceeding 72 square feet	1¼ inch
Above 72 square feet	1½ inch

All Direct Radiators are regularly made with air valve tappings ⅛ inch. When radiators are ordered for vapor or vacuum heating, specific instructions should be given as to method of tapping.

Water radiators are regularly shipped with blank at top of leg sections, but can be tapped 1½ inches or smaller on special order.

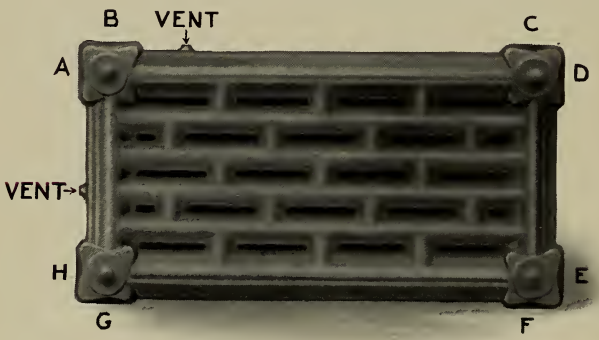
Unless otherwise ordered, all openings of Direct Radiators will have right-hand threads (except that of Wall Radiators where tapped 1½ inches, in which case tapping at one end is right-hand and left-hand on opposite end).

All Radiators listed herein (except Triton Flue and Athenian Wall Radiators) are constructed with heavy non-corrosive push nipples.

ATHENIAN WALL RADIATORS

FOR STEAM AND WATER

THIS style of radiator is well adapted to heat small rooms, narrow halls, bath rooms, churches, gymnasiums, car barns, factories, steamships, etc., where floor space is limited. They are built up in various ways (some of which are illustrated on pages 183 to 187,) so that they may be used horizontally, vertically or in flat form for hanging on ceilings, etc.



SIZES AND MEASUREMENTS

Made in Three Sizes

Sizes	Number of Square Feet in Each Section	Width of Each Section	Length of Each Section	Thichness of Each Section	Extends from Wall with Bracket
Extra large .	9	13¼	29¼	3	3¾
Standard . .	7	13¼	24¼	3	3¾
Small	5	13¼	19¼	3	3¾

Special Pantry Radiator made of wall sections shown on page 110. Methods of assembling are shown on pages 183 to 187.

ATHENIAN WALL RADIATORS

ASSEMBLING

SECTIONS are connected with 1½-inch right and left hand inside nipples, which have two lugs cast on inside. With a bar flattened at one end inserted between these lugs the sections can be easily removed. A bar of 1 x ⅜-inch iron will answer, or the special wrench on page 119.

TAPPINGS

Athenian Wall Radiators are tapped 1½ inches with one end right hand and the other left hand, but are bushed per list on page 121. The inside threads of all bushings are right hand unless otherwise ordered.

If tapping is not shown on illustration as wanted, it should be indicated on a special sketch.

When more than four tappings are required in one section an extra charge is made for the extra tappings, at 10 cents each, net.

DIRECTIONS FOR ORDERING AND SHIPPING

When so ordered Wall Radiator Sections can be shipped separately with nipples for assembling, but unless otherwise specified they will be shipped as follows:

Three sections assembled when like figure 2 or 17; four sections assembled when like figure 6.

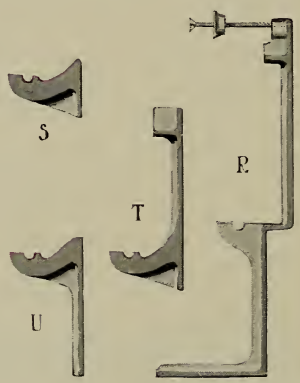
When so specified more sections can be assembled for shipping, for which a net charge of 10 cents for each additional section is made.

A right and left hand threaded nipple having a center hexagon nut is provided to connect the assembled parts on the job. For steam, such parts should be connected at the bottom only, and the upper opening should be plugged.

Both horizontal and vertical tapped sections are carried in stock, but they are not interchangeable, hence to avoid mistakes it is necessary to clearly state which is wanted.

If possible designate style of setting wanted by referring to one of the figure numbers on pages 183 to 187, otherwise make a sketch showing whether the sections are to be set horizontally or vertically, and state how tappings are wanted.

ATHENIAN
WALL RADIATOR BRACKETS



Brackets R fit over baseboard and are made in the three following sizes:

Description	Inches
R No. 1, for 10½-inch base, height from floor to center lower tapping	11½
R No. 2, for 8½-inch base, height from floor to center lower tapping	9½
R No. 3, for 6½-inch base, height from floor to center lower tapping	7½

Brackets S and T are to be used in pairs—the S at top and T at bottom.

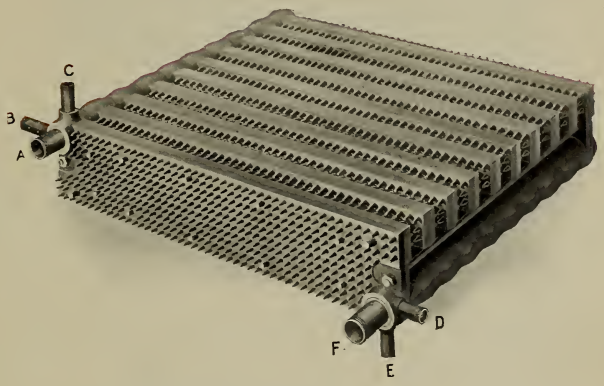
Bracket U to be used in place of T where the bottom of radiator extends to baseboard or wainscoting.

Bracket V having a lag screw 9 inches long for hanging ceiling radiators can be furnished.

When ordering wall radiators be sure to mention which brackets are wanted. Brackets are not included in the price of radiators and will be charged extra.

PIN INDIRECT RADIATORS

FOR STEAM AND WATER



MEASUREMENTS

10 SQUARE FEET PER SECTION

Length of Section Inches	Depth of Section Inches	Depth Over All Inches	Center to Center Push Nipple Inches	Center to Center Screw Nipple Inches
36	7 5/8	8 5/8	3	4

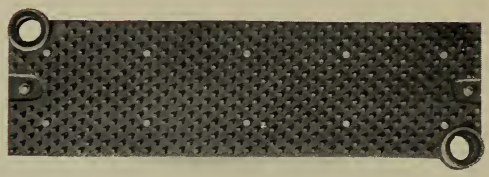
15 SQUARE FEET PER SECTION

Length of Section Inches	Depth of Section Inches	Depth Over All Inches	Center to Center Push Nipple Inches	Center to Center Screw Nipple Inches
36	10 5/8	11 5/8	3	4

See tappings and assembling, page 127.

PIN INDIRECT RADIATORS

FOR STEAM AND WATER



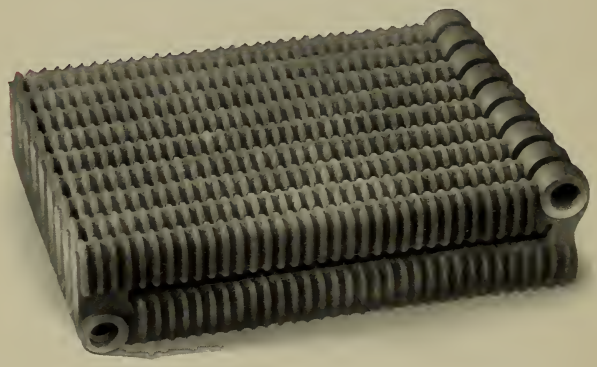
MEASUREMENTS

20 SQUARE FEET PER SECTION

Length of Section Inches	Depth of Section Inches	Depth Over All Inches	Center to Center of Section, Push Nipple, Inches	Center to Center of Section, Screw Nipple, Inches
41¾	12	14	3¾	4¾

CHAMPION INDIRECT RADIATORS

FOR STEAM AND WATER



PRIME SURFACE

10 SQUARE FEET PER SECTION

Length of Section Inches	Depth of Section Inches	Depth Over All Inches	Center to Center of Sections, Inches
36½	9⅛	10¾	3

See tappings and assembling, page 127.

INDIRECT RADIATORS

TAPPINGS on Indirect Radiators can be made at A, B, C, D, E or F, but unless otherwise ordered they will be tapped at A and F, as follows:

Pin 10-foot section, 1½ inches; Pin 15 and 20-foot, and Champion 10-foot sections, 2 inches; bushed as desired.

All Indirect sections are regularly connected with non-corrosive slip nipples, but on special order extra heavy right and left hand screw nipples having hexagon nut at center can be furnished.

Radiator sections are assembled at factory and shipped complete, unless specially ordered otherwise. By assembling at factory the radiators can be thoroughly tested to prevent leaky joints and at the same time save much of Fitter's time in setting.

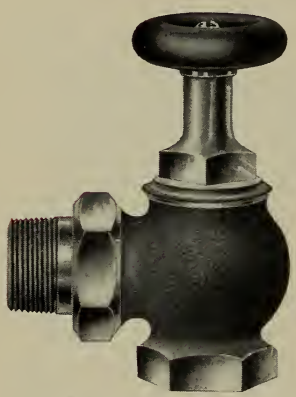
When specially ordered, sections are shipped unassembled with bolts and nipples for putting together, but when so ordering always specify the number of stacks and number of sections in each stack, that the proper bolts may be sent.

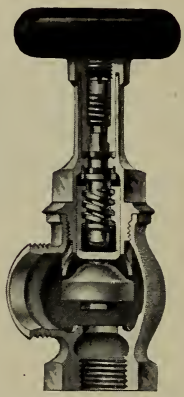
An additional charge of 10 per cent of the net price will be made when hexagon screw nipple connections are ordered.

An additional net charge of one cent per square foot is made for assembling at factory.

TRITON PACKLESS RADIATOR VALVES

FOR STEAM





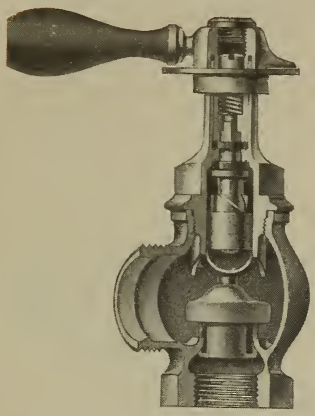
THE Triton Packless Radiator Valve has a number of decided advantages over any other article of its class. Its packless and quick opening features are simple and efficient and the interior arrangements cannot be injured by ordinary abuse. The bonnet is carried up to the under side of the follower plate to protect the working parts from any outside interference.

By referring to the sectional view, it will be seen that the stem is of the non-rising type and is provided with a flange a short distance above the triple thread. Between this flange and the inwardly extending flange of the bonnet is a specially prepared composition washer. Another similar washer is placed immediately above the inwardly extending flange of the bonnet, and upon this second composition washer rests a gland shaped follower plate extending from the handle. A shoulder is formed on the inside of this follower plate and this shoulder supports a spring which bears upward against a nut screwed to the top of the stem. A double service is performed by this spring, as it bears downwards on the upper composition washer and at the same time pulls upwards against the lower composition washer, thus holding both of them tightly against the inwardly extending flange of the bonnet and taking up automatically any wear that may occur in either. This insures an absolutely tight joint against water, steam or air. It has the genuine quick opening feature, as it can be fully opened or fully closed and locked closed by about a three-quarters turn of the handle.

No.	Size, inches . . .	½	¾	1	1¼	1½	2
512	Rough body, plated all over . . .	$3.15	$3.80	$4.75	$6.40	$8.10	$13.10

On special order, can also be furnished with lever handle or lock shields. Plated keys list, 50 cents each extra.

TRITON
GRADUATED PACKLESS VALVES



THE Triton Graduated Packless Valve is similar in construction to the regular packless valve shown on page 128, except that it has a special lever handle, an indicator plate properly graduated into eight sections and means for a special adjustment by which each valve can be accurately adjusted to a wide range of sizes of radiators.

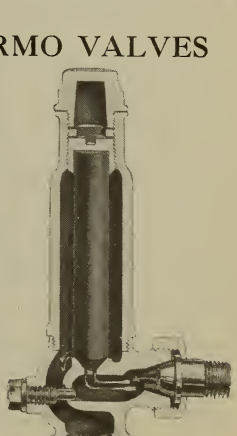
With each valve we furnish four different shells, any one of which may be attached to the disc holder below the disc. If the valve is to be connected to a very small radiator, the shell with the single slot should be used, while if the radiator is of medium or large size, shells with two, three or four slots should be employed. It will remain partly open at any desired position without any danger of variation of the opening unless the handle is moved.

*No.	Size, inches	½	¾	1	1¼	1½	2
522	Graduated Packless Angle Valve, with union	$4.15	$4.80	$5.75	$7.40	$9.10	$14.10
622R	Graduated Packless Right Hand Corner Valve, with union . .	4.45	5.20	6.25	8.05	9.95	15.45
622L	Graduated Packless Left Hand Corner Valve, with union . .	4.45	5.20	6.25	8.05	9.95	15.45

*Rough body, plated all over. On special order can be furnished with lock shields. Plated keys, list 50 cents each extra.

TRITON VACUUM THERMO VALVES

THIS is a very sensitive and efficient return valve. It has a marked advantage over all other valves of its class in the fact that on account of its construction the expansion member cannot become overheated. By reference to the sectional view it will be seen that the steam and water enter from below, and when the carbon post becomes sufficiently heated it closes the inlet and prevents any further heat from striking it, and at the same time permits the water of condensation to pass freely when open. It is automatic in its action and can be adjusted to operate at atmospheric pressure, or will work at from 10 pounds to 100 pounds pressure. In each case it responds almost instantly to a difference of a few degrees of temperature.



No. 10 is adapted to take care of 150 feet of radiation; list, $6.00.

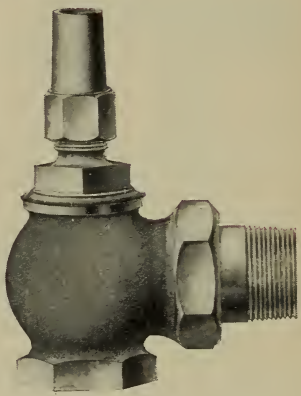
No. 12 is adapted to take care of 250 feet of radiation; list, $8.00.

No. 14 is adapted to take care of 400 feet of radiation; list, $10.00.

UNION RADIATOR VALVES

FOR STEAM

Nos. 112 and 412



Lock and Shield No. 312

JENKINS DISC—ANGLE

No.	Size, inches	½	¾	1	1¼	1½	2
112	Rough body, plated all over	$3.15	$3.80	$4.75	$6.40	$8.10	$13.10

JENKINS DISC—ANGLE. Lock and Shield

No.	Size, inches	½	¾	1	1¼	1½	2
312	Rough body, plated all over	$3.15	$3.80	$4.75	$6.40	$8.10	$13.10

Plated keys, list, 50 cents each extra.

*BRASS DISC—ANGLE

No.	Size, inches	½	¾	1	1¼	1½	2
412	Rough body, plated all over	$2.40	$2.85	$3.65	$5.05	$7.10	$10.85

*When required for hot water heating, a hole for circulation will be drilled through the brass disc. Specify clearly when wanted for water.

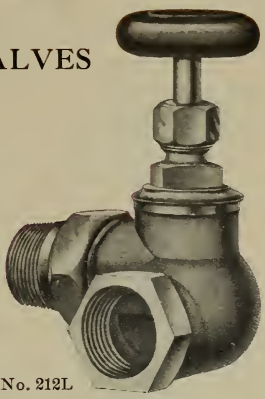
For convenience when ordering, use numbers and sizes only.

UNION CORNER RADIATOR VALVES

FOR STEAM

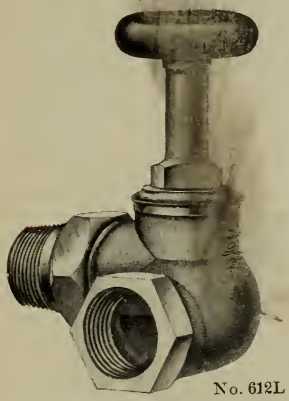
THESE corner valves, with a large area in the body, show a great improvement over the old style.

All steam metal, Jenkins Disc.



No. 212L

No.	Description	Size, Inches					
	Rough Body, Plated All Over	½	¾	1	1¼	1½	2
212R	Right hand	$3.45	$4.20	$5.25	$7.05	$8.95	$14.45
212L	Left hand	3.45	4.20	5.25	7.05	8.95	14.45



No. 612L

TRITON PACKLESS CORNER VALVES

FOR STEAM

THESE valves are of the same construction as the Packless Valves shown on page 128.

No.	Description	Size, Inches					
	Rough Body, Plated All Over	½	¾	1	1¼	1½	2
612R	Right hand	$3.45	$4.20	$5.25	$7.05	$8.95	$14.45
612L	Left hand	3.45	4.20	5.25	7.05	8.95	14.45

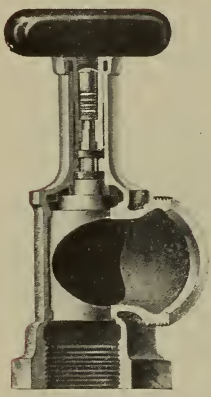
On special orders either style can be furnished with lock shields. Plated keys, list 50 cents each extra.

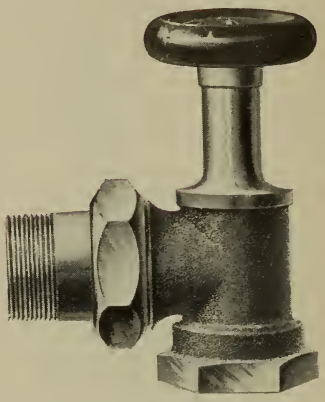
Triton Packless Corner Valves are made in the graduated pattern with lever handle or lock shields. See page 129 for list.

For convenience when ordering use numbers and sizes only.

TRITON PACKLESS RADIATOR VALVES

FOR WATER





THE increasing use of artifical pressure in the installation of hot water heating plants has made even more necessary the use of a hot water radiator valve which, year in and year out, will do its work well without the annoyance of leakage at the stem or the inconvenience of replacing the packing frequently. The discoloration of hard wood floors and of handsomely decorated ceilings, the injury to rugs and carpets, with the consequent annoyance to owner and the necessity to the steam-fitter of frequent and often unprofitable trips to attend to leaking valves, are all done away with by the use of the new Triton Packless Hot Water Valve.

The illustrations show this valve to be more attractive in appearance than other types. Its parts are all heavy and substantial, and the extension of the bonnet up to the handle prevents injury to its mechanism. This mechanism is simple, needs no adjustment, and by reason of the two washers which are made of a special ever-wearing, non-deteriorating composition, prevents leakage at the stem even under heavy pressure. The movable shell has but two points of contact at top and bottom, thus removing the possibility of sticking.

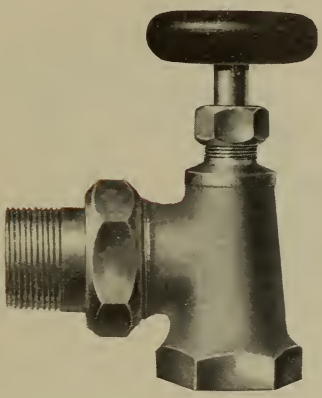
This valve is sold at but a slight advance over the cost of the regular competition types, and appeals immediately to all heating contractors, architects and owners who are seeking quality.

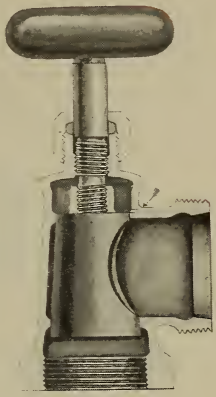
No.	Size, inches	½	¾	1	1¼	1½	2
22	Rough body, plated all over . . .	$2.40	$2.85	$3.65	$5.05	$7.10	$10.85

On special order, can also be furnished with lock shield or lever handle. Plated keys, list 50 cents each extra.

BELL SHAPED
UNION RADIATOR VALVES

FOR WATER





THE Bell Shaped Hot Water Valve has been designed with a view of overcoming the weak points in the ordinary styles. One frequent cause of trouble has been the tendency of the disc to stick to the body after remaining in one position during the summer months, especially as efforts to loosen or release it often cause breakage.

The body is equipped with a cone-shaped disc which is opened or closed by one-half turn of the handle. The stem is squared at its lower end and to this squared portion is fitted a driving arm which actuates the disc. A right hand thread is cut on the lower part of the stem and a little higher a left hand thread is cut. This left hand thread engages with the upper part of the body while the right hand thread engages with the upper part of the disc cone.

When the stem is turned to the right, the disc is revolved and at the same time drawn upward, thus closing the valve with a very tight joint. When the stem is turned to the left, the first portion of the movement releases the disc by forcing it downward.

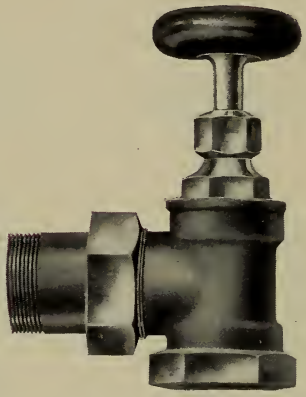
When the motion of the stem is reversed, the driving arm moves one-eighth turn before it engages with the lug on the shell; consequently in all cases the shell is loosened or released by being forced upwards or downwards before the driving arm bears on the lug to revolve it. More metal is placed in those parts subjected to the greatest strains in service than is possible in ordinary valves of the same weight, and as this valve is somewhat heavier than ordinary makes, it follows that it must be considerably stronger. No spring is used and the stem is extra strong, being made from brass rod $\frac{9}{16}$ inch in diameter.

No.	Size, inches	½	¾	1	1¼	1½	2
52	Rough body, plated all over . . .	$2.40	$2.85	$3.65	$5.05	$7.10	$10.85

For convenience when ordering, use numbers and sizes only.

UNION RADIATOR VALVES

FOR WATER



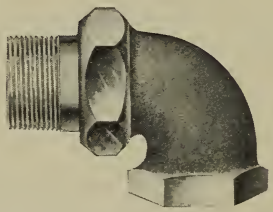
QUICK OPENING—BONNETED

Threaded right hand both on the union and on bottom

No.	Size, inches	½	¾	1	1¼	1½	2
12	Rough body, plated all over . .	$2.40	$2.85	$3.65	$5.05	$7.10	$10.85

UNION RADIATOR ELBOWS

FOR WATER

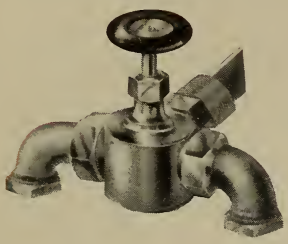


Threaded right hand both on the union and on bottom

No.	Size, inches	½	¾	1	1¼	1½	2
42	Rough body, plated all over . .	$1.75	$2.00	$2.50	$3.20	$4.00	$7.00

For convenience when ordering, use numbers and sizes only.

UNIQUE WATER RADIATOR VALVES



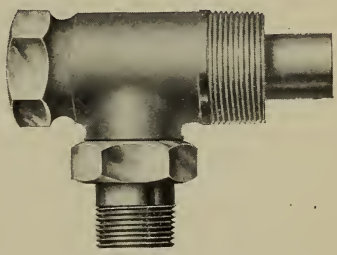
THE use of the Unique Valve does away with the connection at both ends of a water radiator. Its many advantages are apparent, not only for convenience, but in saving fitter's labor and pipe and fittings. Opens and closes with one-sixth turn of the handle.

Size Inches	Center to Center of Elbows Inches	Center of Body to End of Spud Inches	Center of Spud to Bottom of Elbows Inches	Tapping of Radiator when Valve is Used Inches	Price
½	5½	2⅞	1⅞	1¼	$4.25
¾	5¾	2⅞	1⅞	1¼	5.40
1	7	3	2	1½	5.80
1¼	7½	3¼	2⅝	2	7.95

Send for special folder containing full description.

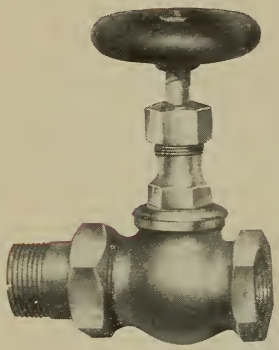
CAPITOL CIRCULATING COUPLINGS

THE Capitol Hot Water Circulating Coupling can be used with any water radiator valve to make up a connection whereby it is desired to have both the supply and return openings at one end of the radiator. Can be set at any angle to meet all conditions. The Circulating Coupling is screwed into the end of the radiator and the water valve screwed into the coupling.



Size Inches	Center of Coupling to End of Pipe Inches	Center of Coupling to Radiator End Inches	Center of Body to End of Spud Inches	Tapping of Radiator when Coupling is Used Inches	Price
½	1½	1⅝	2½	1	$2.50
¾	1¾	1¾	2¾	1¼	2.80
1	2	2⅛	2⅞	1½	3.70
1¼	2⅛	2¼	3½	2	4.50
1½	2⅛	2½	4	2	5.35

BRASS GLOBE RADIATOR VALVES

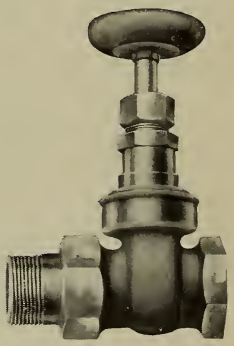


JENKINS
DISC WITH UNION

No.	Description	Size, inches				
		¾	1	1¼	1½	2
812	Rough body, plated all over	$3.80	$4.75	$6.40	$8.10	$13.10

STRAIGHTWAY RADIATOR VALVES

USED for hot water work where straightway connection is desired. Equipped with double brass gate and finished same as regular hot water radiator valves. Opens to the left; non-rising stem.

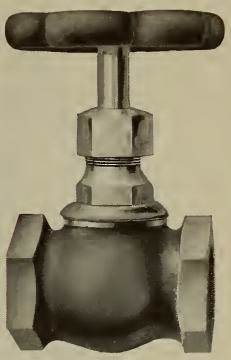


No.	Description	Size, inches					
		½	¾	1	1¼	1½	2
256	Rough body, plated all over . . .	$3.10	$3.75	$4.65	$6.10	$7.85	$12.10

For convenience in ordering, use numbers and sizes only.

BRASS GLOBE AND ANGLE VALVES

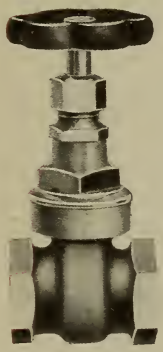
ROUGH BODY
IRON WHEEL
SCREWED



Globe Valve

Size, inches	⅛	¼	⅜	½	¾	1	1¼	1½	2
Standard	$0.72	$0.72	$0.77	$1.00	$1.26	$1.80	$2.52	$3.50	$5.30
Jenkins Disc	1.10	1.10	1.25	1.60	2.20	2.80	4.00	5.50	8.75

STRAIGHTWAY VALVES



No. 200—Brass, double gate, iron wheel, opens to left, non-rising stem, screwed end.

No. 300—Standard, double gate, iron body, screwed stuffing box, screwed or flanged end. (Note.)

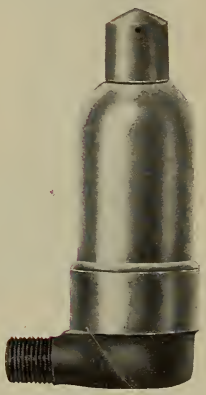
No. 600—Standard, double gate, iron body, bolted gland stuffing box, screwed or flanged end. (Note.)

NOTE—Orders for Nos. 300 or 600 must specify whether screwed or flanged ends are wanted.

Size, inches	¾	1	1¼	1½	2	2½	3	3½
No. 200	$1.75	$2.50	$3.50	$5.00	$7.50	$14.00	$20.00	. . .
No. 300	. . .	. . .	. . .	. . .	10.00	12.00	15.00	$18.00

Size, inches	4	4½	5	6	7	8	10	12
No. 600	$20.00	$23.00	$25.00	$30.00	$45.00	$55.00	$90.00	$125.00

AUTOMATIC AIR AND VACUUM VALVES



Triton Air Valve

Triton Air and Vacuum Valve

THE Triton Air Valve is the best constructed valve on the market, which is made up with an expansion cylinder. In the shell of the valve is a sealed metal float with flexible top and bottom. This float contains a liquid easily affected by heat, which vaporizes at 151 degrees Fahr., expanding the corrugations, top and bottom, closing the valve against loss of steam or water. When the valve cools below the above temperature, the vapor condenses and the float contracts, thus opening the valve. Note that the valve does not open until the temperature falls to 151 degrees Fahr., thereby insuring an effective radiator when only vapor is in the system. The float being lighter than water, and sealed, carries perfect floatation, so that the valve will close tightly should there be water in the radiator. It is also equipped with baffle plate which prevents float from closing by sudden pressure. Guaranteed for five years.

No. 3. Triton automatic air valve . . . . . price each $1.15

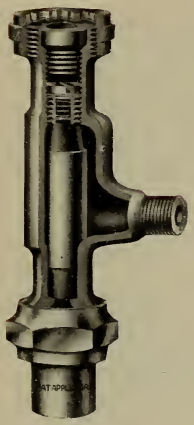
TRITON AIR AND VACUUM VALVE

The vacuum attachment permits all air to pass freely out of the radiators but prevents it from re-entering, after pressure goes down. The valve can be cleaned and kept in perfect working order, as all parts are accessible, and is made entirely of metal so that it is practically indestructible. In all other respects it is similar to the No. 3.

No. 4. Triton automatic air and vacuum valve . price each $2.00

On special order, the No. 3 Triton Air Valve can be furnished with heat controller attachment or lock and shield at an extra charge of 25 cents net each.

PAUL AUTOMATIC AIR VALVES



FOR use on Paul systems, also as drip valves on radiators. The expansion post is reinforced by brass encasement, therefore cannot buckle. Patented spring cap prevents seat from being crushed. Lead-packed cap does away with any possibility of leakage. Tapped ⅛ inch for connection with radiator; drip connection, ¼ inch.

Price each $1.25

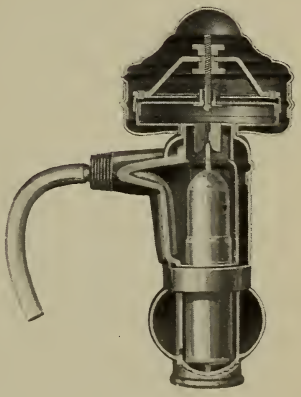
On special order can furnish Return Pipe Valve of same description, 6½ inches long, with both side and bottom tapped ½ inch.

Price each $3.00

AUTOMATIC AIR AND VACUUM VALVES

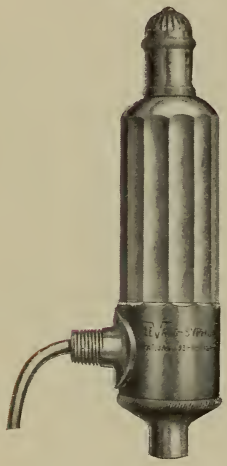
THE Norwall Vacuum Valve is a float valve operated entirely by the expansion and contraction of air. Automatically vents the air from the radiator and at the same time is arranged so that the valve closes against the ingress of air when the pressure goes down.

The Norwall Syphon Air Valve is constructed the same as the vacuum valve illustrated, except that it is fitted with a cap instead of the vacuum attachment.

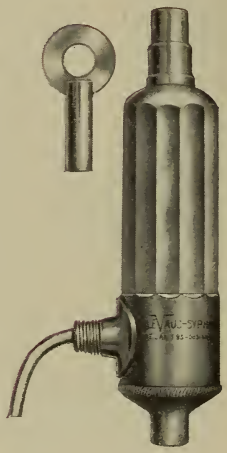


Norwall Vacuum Valve . . . . . price each $4.00
Norwall Syphon Air Valve . . . . . price each 1.70
Norwall Air Valve, without syphon or globe body, price each 1.30

CLEVAUC SYPHON AIR VALVES



No. 15



No. 16 Lock Shield

THIS is the original syphon or self-emptying valve. The weight of the small column of water which works it way into the syphon is sufficient to overcome the capillary attraction which exists within the valve, thereby withdrawing the water of condensation back into the radiator, allowing the float to lower while the air within the radiator is allowed to escape in the manner intended.

The extra length of shell is designed so as to provide a separating chamber wherein the water of condensation will have on opportunity to settle into the bottom of the valve instead of being drawn by the steam over the float, through the air opening and into the room. These two features positively prevent any discharge of water from the valve through the air vent.

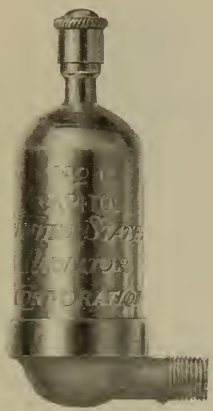
Special attention is directed to the long expansion post with which the valve is provided, and the valve stem made with ball joint which does away with any possibility of sticking.

This lock shield type is especially suitable for use in public institutions, hotels, office buildings, schools, etc., where the adjustment is in the hands of one person.

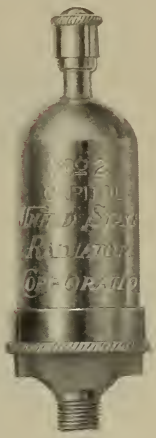
Both styles are of the latest ornamental pattern. Fully guaranteed.

No. 15, Clevauc syphon, regular pattern . . .	price each	$1.00
No. 16, Clevauc syphon, with lock and shield .	price each	1.25

CAPITOL AUTOMATIC AIR VALVES



No. 1



No. 2

CAPITOL Automatic Air Valves have combination float and expansion post, and respond quickly and surely with either water or steam.

When water enters the valve the round float is lifted until the pin closes the air hole. The float drops as soon as the water leaves the valve.

When steam enters the valve, the post is expanded by the heat and lifts the float until the pin closes the opening.

The valve body is made of brass, nickel-plated and highly finished. The post is made of highly sensitive composition, the best known for the purpose.

The bottom connection of the No. 2 valve makes it particularly adapted for indirect radiators, coils, etc.

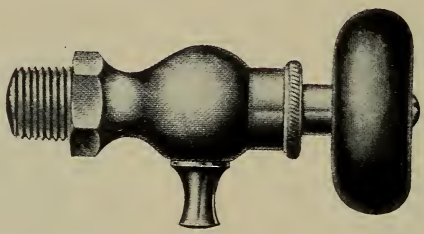
We guarantee perfect operation and will replace any valve found defective.

Both regularly threaded for ⅛-inch tapping.

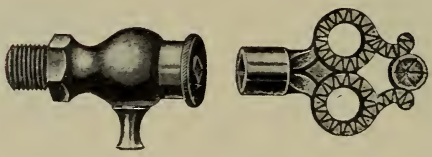
Can furnish No. 2 valve with ¼-inch tapping on special order.

No. 1 Capitol	price each	$0.75
No. 2 Capitol, with straight shank	price each	1.00

COMPRESSION AIR VALVES



No. 8. Wood Wheel, nickel-plated, per dozen $2.00



No. 9. With Key, nickel-plated, per dozen $1.80

No. 10. Positive and automatic, nickel-plated, per dozen . $3.00

This valve can be used with equal facility as a positive or an automatic air valve without change or adjustment. It operates very quickly and will last a lifetime. Fully guaranteed.

All above valves threaded for ⅛-inch iron pipe.

Full Size

VACUUM ATTACHMENT

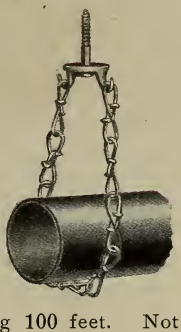
THIS attachment is made to fit any ordinary air valve having a removable cap, and will do the work of a more complicated vacuum valve. It is especially adapted to improving any steam system, already installed, although the original installation may not have been intended for working under vacuum.

No. 12. Nickel-plated, per dozen . . $3.00

CHAIN PIPE HANGERS

A very convenient and economical pipe hanger, strong and easy of adjustment.

Size of Chain Number	For Pipe Inches	Chain		Ox Bow Hangers	
		Tensile Strength Pounds	Price per 100 Feet	Size	Price per C
4	1 to 1¼	540	$2.75	Small	$3.00
2	1½ to 2	700	3.10		
0	2½ to 3	1150	4.00	Large	4.50
000	3½ to 8	1800	5.25		

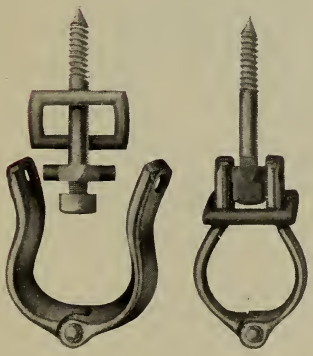


Chain only shipped in packages containing 100 feet. Not necessary to order hangers unless this manner of fastening is desired. If hanger is wanted specify exact quantity to be shipped.

CAPITOL PIPE HANGERS

Simplest, strongest, best

PRICE LIST

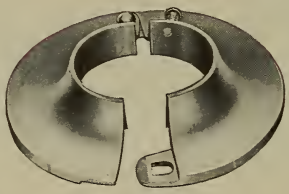


Size	Price
½	$0.20
¾	.22
1	.25
1¼	.30
1½	.38
2	.44
2½	.55
3	.65
3½	.90
4	1.15
5	1.50
6	2.25

The above hangers furnished with 4-inch lag screws. Longer lags can be supplied on special order, if desired.

FLOOR AND CEILING PLATES

B. AND C.



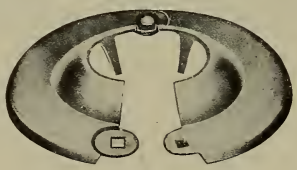
Ceiling

B. and C. adjustable hinged plates are constructed so that the ceiling plate is held in place by means of a screw; the floor plate simply snapped around pipe. Copper-plated before nickeling. Specify whether floor or ceiling plates are wanted.

For pipe, inches .	*⅜	½	¾	1	1¼	1½	2	2½	3	3½	4
Nickeled, each .	$0.25	$0.25	$0.25	$0.28	$0.32	$0.35	$0.38	$0.52	$0.75	$1.10	$1.50
Black, each . .	.14	.14	.14	.18	.20	.24	.28	.48	.60	.90	1.25

* ⅜-inch plate can only be furnished in floor pattern.

SNAPLOCK



Floor or Ceiling

Snaplock floor and ceiling plates are made of but two pieces of cold rolled steel, riveted together. Nothing to get out of order or lost. Better than any one-piece stamped plate because of their strength and the fact they can be applied after balance of work is completed. Finished same as higher priced plates.

For pipe, inches	½	¾	1	1¼	1½	2
Nickeled, each	$0.25	$0.25	$0.28	$0.32	$0.35	$0.38
Black, each	.14	.14	.18	.20	.24	.28

FLOOR AND CEILING PLATES

PERFECTION

Inverted

Top

The No. 10 Perfection spring plate is one of the strongest and neatest now on the market. Made of cold rolled steel with the halves securely riveted by a concealed hinge. Can be opened or closed on pipe without effort.

For pipe, inches	½	¾	1	1¼	1½	2
No. 10, nickeled, each	$0.25	$0.25	$0.28	$0.32	$0.35	$0.38
No. 10, black, each	.14	.14	.18	.20	.24	.28

CAPITOL

Closed

Open

Capitol Combination plates can be used for floor or ceiling. Both are held in place by a screw in the collar.

For pipe, inches	½	¾	1	1¼	1½	2
Nickeled, each	$0.25	$0.25	$0.28	$0.32	$0.35	$0.38
Black, each	.14	.14	.18	.20	.24	.28

CAPITOL HOT WATER THERMOMETERS

No. 10 Straight

No. 20 Angle

THE Capitol Hot Water Thermometer is a necessary adjunct to a hot water heating plant. Will record temperatures accurately and quickly. Care should be taken to be sure that the metal tube surrounding the glass bulb is thoroughly immersed in the hot water. Lower part of the tube is immersed in a mercury bath.

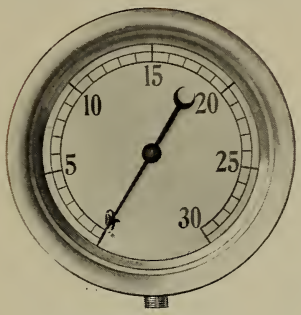
If face does not set in right position when tightened, loosen the screw on the tail-piece, turn face to correct position without lifting, then tighten screw.

Regularly furnished with red spirit liquid, which indicates the temperature more clearly than thermometers made up with mercury columns.

Each thermometer tested before leaving the factory and packed carefully in a wooden box. Threaded for ½-inch tapping.

No. 10 Straight	price each	$1.70
No. 20 Angle	price each	2.00

CAPITOL GAUGES



STEAM GAUGE

Registers pressure up to 30 pounds. Movement made of non-corrosive metal.
Price each, without cock $3.30
Can supply high pressure gauges when required. Write for prices.

ALTITUDE GAUGE

Indicates at the boiler the height of water in the system. Fitted with red adjustable hand, to be set at height desired by the user. The black operating hand indicates the actual height of water and therefore shows any variations in the water level.

To set: Fill the system to its proper level, move red hand to the height indicated by the operating hand. Water should be added as soon as the water falls below the height indicated by the red hand. Ring that holds glass is secured by cotter pins to permit of easy removal for setting.
Price each, with cock $3.70

COMPOUND GAUGE

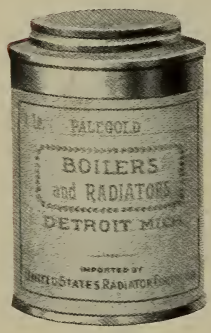
Compound gauges register steam pressure up to 30 pounds and vacuum down to 30 inches.
Price each, without cock $5.00

SPECIFICATIONS COVERING ALL GAUGES LISTED

4½-inch dial, iron case, no back flange, flare nickeled ring, silvered dials and black letters. Made from highest grade material with the utmost care used in testing.

CAPITOL BRONZES

WE have devoted considerable study to the question of offering the trade a line of Radiator Bronzes that would recommend itself after it had once been used. Our strongest effort has been to furnish the best values, considering carefully the rich and brilliant finish, amount of covering capacity and lasting qualities.



DIRECTIONS FOR USE

BRONZES—Use a bronze primer, or if you want to finish a job quickly, give the radiator first a coat of bronzing liquid; this will dry in about twenty minutes with a gloss covering up all the dirt and rust. Then mix the bronze powder with the bronzing liquid to the consistency of cream and apply evenly, that is, in one direction only. Always use a soft brush, as a stiff brush cuts the bronze, ruining the high finish. If bronze is applied when radiator is warm, the lustre is improved.

One pound of gold or color bronze requires one quart of liquid and will cover from 250 to 300 square feet of radiation.

One pound of aluminum bronze requires about one gallon of liquid and will cover from 500 to 600 square feet of radiation.

CAPITOL BRONZE POWDERS

	List, Each
Pale Gold, one-pound cans	$ .90
Rich Gold, one-pound cans	.90
Pure Metal Leaf, one-pound cans	1.25

(Pure Metal Leaf Bronze is the highest grade of pale gold, unrivalled in brilliancy and permanency of tone and color.)

Aluminum, one-pound cans	1.50
Aluminum, half-pound cans	.90
Aluminum, quarter-pound cans	.50

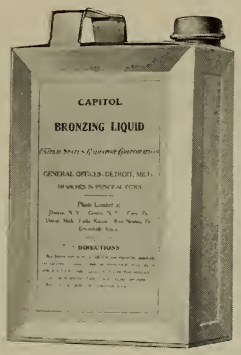
(Aluminum Bronze guaranteed chemically pure.)

Green, one-pound cans	1.25
Maroon, one-pound cans	1.50
Chocolate, one-pound cans	1.50
Copper, one-pound cans	1.25
Fire, one-pound cans	1.25

To get best results we recommend the use of Capitol Bronzing Liquid.

We can furnish on application, color card showing above and other special colors.

CAPITOL BRONZING LIQUID



A LIQUID for use in mixing with gold, aluminum or other bronze powders; to act as a vehicle for them and a binder to the surface over which they are applied. The color is so light that it has no effect on the most delicate bronze tints, and the body is such that it does not interfere with the luster of the bronze itself.

When liquid is not in use, keep can tightly covered, otherwise evaporation takes place, thickening the liquid and making it unuseable. Mix only in clean cans. Put up in gallons, half gallons and quarts.

CAPITOL BRONZE PRIMER

Especially made for use on radiators, as it does not contain any material of non-radiating nature. It is used as a filler, making a smoother surface and reducing the amount of bronze necessary for the work. Furnished in same size cans as bronzing liquid.

CAPITOL MAROON JAPAN

Makes an attractive finish at a low cost, dries quickly with a high gloss which is not affected by heat. Recommended for use on radiators in public places where durability counts. Supplied in gallon, half gallon and quart cans.

BLACK ASPHALTUM

For painting boilers, castings, steam or water pipes, etc. Regularly sold in one gallon cans. Special price quoted in barrel lots.

CAPITOL EXPANSION TANKS

TAPPED at top for 1-inch overflow pipe; at bottom for 1-inch expansion pipe; at side for water supply.

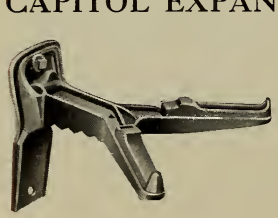
Made from a superior grade of heavy boiler steel, riveted, caulked and galvanized.

Are to be preferred in every case to the ordinary tanks of light iron, which are liable to collapse and have no durability.

Capacity Gallons	Size Inches	Square Feet of Radiation	Price Each Without Trimmings	Price Each Complete With Gauge
8	10 x 20	250	$7.50	$9.25
10	12 x 20	300	8.00	9.75
15	12 x 30	500	9.00	10.75
18	12 x 36	600	9.50	11.25
20	14 x 30	700	12.50	14.25
26	16 x 30	950	14.00	15.75
32	16 x 36	1300	15.00	16.75
42	16 x 48	2000	16.50	18.25
66	18 x 60	3000	31.00	32.75
82	20 x 60	5000	37.00	38.75
100	22 x 60	6000	51.00	52.75

NOTE—Tanks complete with trimmings will be shipped unless otherwise ordered. Horizontal Expansion Tanks can be furnished on special order.

CAPITOL EXPANSION TANK BRACKETS

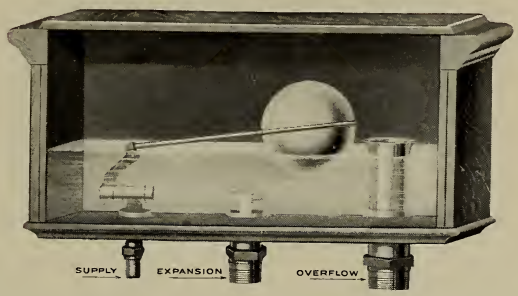


EASIER and cheaper to install than building a shelf. It can be adjusted for all sizes of tanks from 10 to 16 inches in diameter. Furnished with necessary screws.

Weight, 5½ pounds.

Price each, complete, $1.75.

CAPITOL
AUTOMATIC EXPANSION TANKS



USED in connection with hot water systems, they insure a full supply of water, at the same time taking care of the overflow. Made of hard wood, lined with sheet copper and furnished with cast brass fittings. Neither gauge glass nor altitude gauge is needed with them and with their use there is no danger of freezing when placed in attic or out of the way closet.

The inside measurements are :

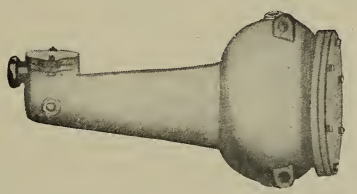
Length, 20 inches. Width, 9 inches. Depth, 10 inches.

Can be used on any hot water job containing up to 3000 feet of radiation.

No. 302, Plain Oak, varnished, square corners . . . . . price each $8.50

Upon special order can be finished in cherry, walnut or quartered oak at extra charge of $1.25 each, net.

CAPITOL
AUTOMATIC WATER FEEDERS



FOR automatically controlling the water level of low pressure heating boilers. Can be cleaned without disturbing pipe connection. Supplied with or without water gauge.

SPECIFICATIONS

Height, 12 inches. Length, 24 inches. Width, 9 inches.
Boiler connection, 1 inch. Feed water inlet, ¾ inch.

No. 61 Without gauge . . . . . price each $15.00
No. 62 With gauge . . . . . price each 18.00

STANDARD STORAGE TANKS

$\frac{3}{16}$-inch Shell, ¼-inch Heads

Capacity Gallons	Diam. Inches	Length Feet	Approx. Weight Pounds	Regular Openings Inches	Price of Tanks Only		Coils Built in Tanks		
					Plain	Galvanized	Size Inches With 4 Pipes	List Plain	List Galvanized
66	20	4	250	1½	$43.00	$57.00	1	$12.00	$15.00
85	20	5	290	1½	45.00	61.00	1	12.00	15.00
100	24	4	300	1½	47.00	64.00	1¼	14.00	17.00
120	24	5	350	1½	50.00	69.00	1¼	14.00	17.00
140	24	6	400	1½	52.00	74.00	1¼	16.00	19.00
150	30	4	420	2	55.00	79.00	1¼	14.00	17.00
180	30	5	480	2	60.00	90.00	1¼	14.00	17.00
220	30	6	540	2	64.00	97.00	1¼	16.00	19.00
250	30	7	600	2	70.00	106.00	1¼	18.00	21.00
295	30	8	660	2	77.00	117.00	1¼	20.00	23.00
315	36	6	740	2	82.00	126.00	1½	20.00	23.00
365	36	7	820	2	90.00	139.00	1½	22.00	25.00
420	36	8	900	2	96.00	150.00	1½	24.00	28.00
475	36	9	980	2	101.00	160.00	1½	26.00	30.00
525	36	10	1060	2	106.00	170.00	1½	28.00	32.00
430	42	6	890	2	102.00		1½	20.00	23.00
500	42	7	1000	2	110.00		1½	22.00	25.00
575	42	8	1080	2	116.00		1½	24.00	28.00
720	42	10	1260	2	128.00		1½	28.00	32.00
865	42	12	1450	2	140.00		1½	32.00	36.00
1000	42	14	1650	2	156.00		1½	36.00	40.00

Handhole in shell or head, list extra	$5.00
Manhole in head, list extra	15.00
Extra flanges, 2-inch or 2½-inch, list extra	5.00
Extra flanges, 3-inch or 3½-inch, list extra	6.00

IN ordering, state whether vertical or horizontal tanks are wanted. Unless otherwise ordered, tanks without coils, manholes or handholes will be shipped. We recommend that tanks containing coils also have manhole placed in head. Remember this when estimating.

All standard tanks tested to 100 pounds hydrostatic pressure and guaranteed for water storage purposes at working pressure not to exceed 65 pounds.

We can furnish quotations on extra heavy tanks for use under higher pressure. Give us copy of your specification.

CAPITOL GAS BURNERS

THIS burner is constructed particularly for boilers or heaters having fire-pots with square corners. It can be fitted to any size grate on account of burner bases being made in three different sizes, with two, three or four holes. Each base is five inches wide and tapped on end for ¾-inch nipples so they can be connected and made any length desired. The individual rows of burners are placed lengthwise of the grate and by putting in enough rows to cover the width and making them full length, sufficient burner capacity can be secured.

Burners are easily installed, as it is only necessary to lay them on top of the grate bars, connecting each row with pipe to the under side of the bases which are tapped. Should grate bar interfere with tapping, one or more can be removed. No drilling or fitting is necessary because the supply pipe is taken out through the ash pit door and attached to header outside of boiler.

These burners have been thoroughly tested and have proven very economical because the burners are separated into a number of rows which prevent too much air or gas coming through any one tube. Each small burner has its own mixer.

When ordering give measurements of grate, stating which dimension is width and which is length, and if possible the name and number of boiler.

2-hole base	5 inches wide, 9¾ inches long.
3-hole base	5 inches wide, 15 inches long.
4-hole base	5 inches wide, 20 inches long.
Burners complete, per hole	$1.00
Burner top, only, each	.50

CAPITOL AUXILIARY HEATERS

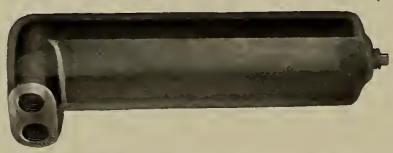
THESE cast-iron heaters are a perfect substitute for the old style pipe coils formerly placed in the combustion chamber for heating water for domestic purposes. They have a greater efficiency by reason of the divided circulation than is possible in any other form, and at the same time do not interfere with the draft.

Can be used in furnaces and stoves for heating rooms out of reach of hot air pipes; for heating range boilers, heating water by steam, also for superheating steam and heating compressed air.

Made in iron or brass. When iron rust in hot water is to be avoided, we recommend the use of the brass section. On special order the 6, 8, 12 and 14-inch sizes can be furnished with side instead of bottom inlet at an addition of $3.00 to the list prices shown below.

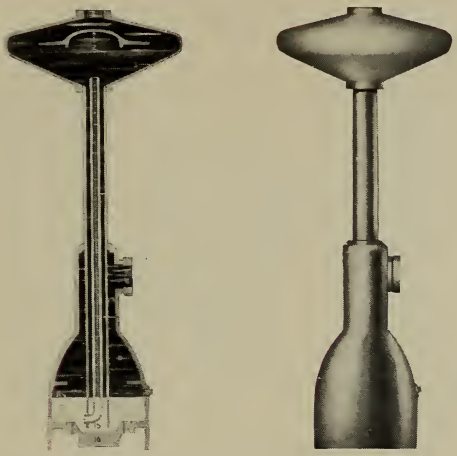
Size Inches	Height Inches	Tapping Inches	Number of Bends	Capacity Square Feet	Price List Iron	Price List Brass
5	3	1	8	30	$3.50	$8.50
6	3	1	8	35	4.00	9.50
8	4½	1¼	12	75	8.50	24.00
12	6	2	10	125	12.50	48.50
14	7½	2½	14	200	16.50	78.00
16	7	3	12	300	20.00	102.50
20	8	3½	16	500	43.50	193.50

CAPITOL WATER-BACK



Used in square sectional boilers for heating water for domestic purposes.
Arranged with proper openings for flow and return pipes. Made of cast iron.
Tapped ¾ inch for flow and return, measuring $2\frac{7}{16}$ inches on centers. Also tapped ½ inch for drain.
Width, 3¾ inches; length, 14 inches; capacity, 40 gallons; list $10.00.

HONEYWELL HEAT GENERATORS



THESE generators are designed to meet the demand for a device to quicken the circulation in hot water heating jobs and broaden the range of temperatures.

When connected to the expansion pipe of an ordinary gravity plant, this generator seals the circuit and permits the generation of a slight pressure up to ten pounds, at which point it relieves itself through the operation of a mercury seal, eliminating any element of danger.

The pressure created by this generator will assist in remedying any unsatisfactory job of hot water heating where the radiation is insufficient, the piping too small for gravity, the circulation sluggish, or where the water boils easily from quick firing, provided, of course, the boiler is large enough to supply the heat. It also greatly improves jobs which contain long horizontal mains or where radiation is all located on the first floor. Should large piping be used in connection with the generator, one size smaller radiator tapping than regular should be used near the boiler.

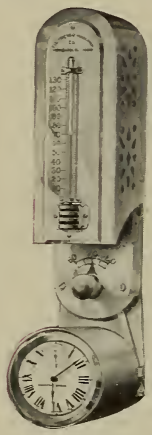
It is positive and automatic, sold under the strongest guarantee, will last a lifetime and cannot get out of order.

Sectional outline view shows connection to system, circulating pipe and deflecting plate.

Price List

No. 1 for	1,200 square feet of radiation	$25.00
No. 2 for	2,500 square feet of radiation	35.00
No. 3 for	3,500 square feet of radiation	50.00
No. 4 for	10,000 square feet of radiation	65.00

MINNEAPOLIS HEAT REGULATORS



Thermostat with Time Attachment

Thermostat with Screen Removed

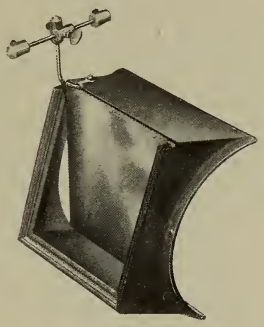
THE regulator complete consists of the thermostat and a motor operated by battery cells. When circular metal blade expands or contracts through change of temperature, the bottom end touches either post, and the connection formed allows the electric current to start the motor. The brake is thus released and the driving shaft of the motor makes a half revolution, opening or closing the dampers.

The time attachment consists of a clock securely held by spring clamps to the Thermostat. The clock is detachable, and may be removed instantly for winding and also for setting the alarm. Replaced by simply putting it back in position. Needs rewinding but once in every eight days, which insures the regular morning change of temperature even should the alarm be forgotten for a week. If it is desired to keep the building at a lower temperature during the night than that maintained during the day, it can be done as follows: Shift pointer to temperature desired for night and set alarm for the time that day temperature is desired to commence. The dampers are regulated at that temperature until time set for day temperature, when pointer is automatically moved to 70 degrees. During the day the pointer can be set at any temperature desired. The range of temperature is fixed by adjusting the set screws at each side of temperature blade. A travel of two degrees is found to give the best results for ordinary use.

Price for regulator complete with time attachment . . . $47.00
Price for regulator without time attachment 40.00

Can be easily applied to any style of heating apparatus, old or new. Complete descriptive circular on application.

CAPITOL AUTOMATIC DRAFT REGULATOR

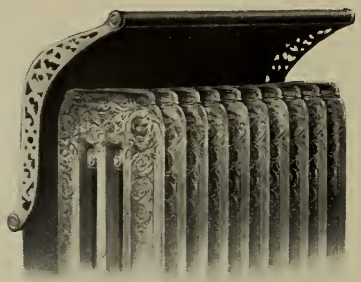


THE Capitol Automatic Draft Regulator is a patented appliance designed to be attached to the smoke-pipe of any kind of a heating apparatus for the purpose of governing or controlling the action of the draft on the fire. It is equally effective on the smallest heater or the largest tubular boiler, regulating the draft so as to keep an even, steady fire, irrespective of high or low winds. The automatic feature is operated by natural forces, that is, instead of allowing every puff of wind to draw the heat out of the coal and up the chimney, it permits the increased air to be pulled from the cellar instead of through the fire.

The primary object in designing the regulator was to prevent waste of fuel, at the same time arranging for more perfect combustion and saving of labor in the handling of the fire. Fitted ready to be attached to smoke-pipe.

For Pipe Inches	List	For Pipe Inches	List
6	$5.00	12	$12.00
7	5.50	14	14.00
8	6.00	15	15.00
9	7.50	16	17.00
10	8.00		

ROYAL RADIATOR SHIELDS



ROYAL Radiator Shields are very effective, neat in appearance, adjustable to any radiator, easily attached or detached. As shown in illustration, they can be furnished in either top pattern or floor extension pattern.

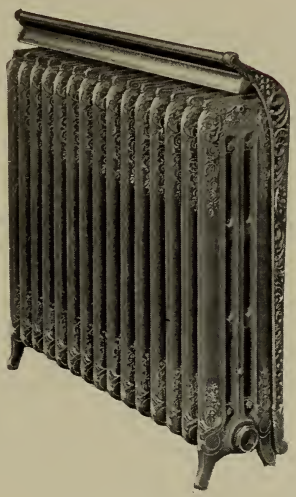
Number of Sections or Loops in Radiators	Wood's Smooth Charcoal Iron, Cast-iron Ends	Bronzed Gold, Copper or Aluminum or Imitation Bower-Barff	Wood's Smooth Charcoal Iron, Nickel-plated Ends	Bronzed Gold, Copper or Aluminum Nickel-plated Ends	Russia Iron Nickel-plated Ends
10	$2.40	$3.20	$4.00	$4.80	$8.00
11	2.50	3.40	4.10	5.00	8.30
12	2.65	3.60	4.25	5.20	8.60
13	2.75	3.80	4.35	5.40	8.90
14	2.90	4.00	4.50	5.60	9.20
15	3.00	4.20	4.60	5.80	9.50
16	3.10	4.40	4.75	6.00	9.80
17	3.25	4.60	4.85	6.20	10.10
18	3.35	4.80	5.00	6.40	10.40
19	3.50	5.00	5.10	6.60	10.70
20	3.60	5.20	5.25	6.80	11.00

Double the list price for Shields extending to floor. For price of Galvanized Iron Shields, add two cents net per loop to Wood's Smooth Charcoal Iron, cast-iron ends. Prices include improved adjustable clamps for attaching. Above twenty sections or loops, prices given on application. The price on ten loops or under is the same. Boxing charged at cost.

IN ORDERING, GIVE THE FOLLOWING

Name or make of radiators if possible. Number of sections or loops in each radiator. Number of columns in each loop or section. Distance between centers of each loop or section. Width of each loop. Length of radiator over all at top. Distance of radiator from wall. Height of radiator (in ordering shields to extend to floor).

CAPITOL RADIATOR SHIELDS



Made in Three Lengths

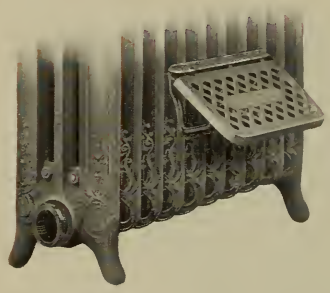
EQUIPPED with patented dust retainer, which can be lowered for the purpose of cleaning. The dust retainer is nominally kept in its closed position by means of springs at each end. All dust and particles which ascend in the air currents arising from the radiator are accumulated in the dust retainer, where they can be easily removed.

Number of Sections	*Le'gth of Shields Inches	Sheet Steel C. I. Brackets	Bronzed Sheet Steel C. I. Brackets	Solid Brass Plated Brackets	Number of Sections	*Le'gth of Shields Inches	Sheet Steel C. I. Brackets	Bronzed Sheet Steel C. I. Brackets	Solid Brass Plated Brackets
3–6	15	$3.18	$6.09	$9.27	16	40	$6.07	$9.09	$17.61
7	17½	3.44	6.26	10.07	17	42½	6.56	9.42	18.48
8	20	3.66	6.65	10.88	18	45	7.01	9.75	19.37
9	22½	3.92	6.93	11.70	19	47½	7.13	10.15	20.25
10	25	4.21	7.23	12.51	20	50	7.50	10.44	21.15
11	27½	4.50	7.50	13.35	21	52½	7.88	10.78	22.07
12	30	4.80	7.83	14.19	22	55	8.27	11.15	22.97
13	32½	5.10	8.13	15.03	23	57½	8.66	11.50	23.90
14	35	5.38	8.42	15.89	24	60	9.00	11.88	24.83
15	37½	5.74	8.76	16.74	25	62½	9.48	12.24	25.76

In ordering, state whether full, medium or short length shields are desired. Also give name, height and number of sections in radiator. If unable to give name of radiator, state length of radiator over all at top, and distance between center of each section.

* On special order, shields of any exact lengths will be made.

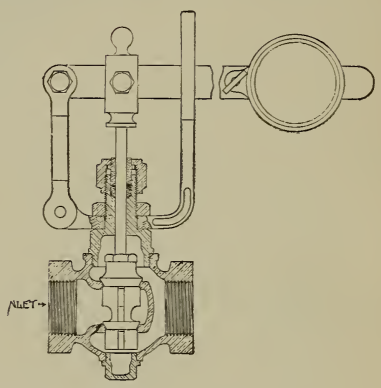
CAPITOL FOOT RESTS



THE most practical and convenient Foot Rest designed. Simple in construction and can be attached to any width radiator. Easily fastened to any cast iron radiator by means of "T" headed bolt. In addition to position in illustration, shelf can be set horizontally and used as a warmer for plates, etc. When not in use, can be closed flush with radiator.

Price, undecorated, each $2.00
Price, nickel-plated, each 2.75

CAPITOL REGULATING VALVES

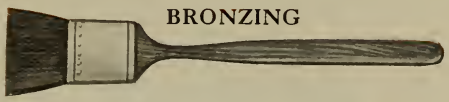


VERY widely used for the control of steam, water, air or gas. Especially suitable for use in connection with heat regulating devices. Also recommended for any service where an extremely sensitive and positive action is necessary. The form of the valve chambers, as shown in illustration, is such that they have full areas and no obstructive passage. Made with two bevel seat discs, the top seat slightly larger to allow the lower disc to pass through the upper opening. No matter what the pressure only a slight movement of the float is required either to open or close the valve.

Size, inches	½	¾	1	1¼	1½
Brass, screwed	$5.50	$5.50	$6.00	$7.25	$9.00
Size, inches	2	2½	3	3½	4
Brass, screwed	$15.00	$21.00	$34.00	$50.00	$65.00
Iron body, screwed	. . .	. . .	32.00	40.00	50.00

CAPITOL BRUSHES

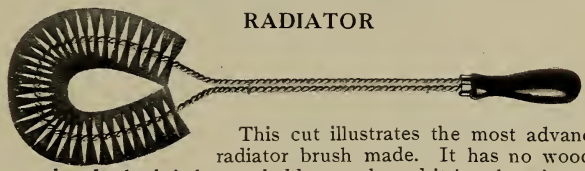
BRONZING



CAPITOL Bronzing Brushes have extra long handles, making them most practical for easily bronzing radiators. The bristles are of fine quality, especially suited for high grade work.

1-inch, each, $0.40 — 2-inch, each, $0.60
1½-inch, each, .50 — 2½-inch, each, .70

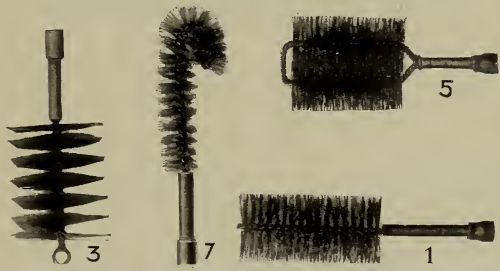
RADIATOR



This cut illustrates the most advanced radiator brush made. It has no wooden parts to break, the bristles are held securely and it is otherwise very durable. The shape and size make it possible to remove any accumulation of dust from the interior surface of the radiator with one motion of the brush. Also handy for cleaning between spindles of stairway, under heavy furniture or in out of the way corners.

Capitol Radiator Brushes . . . . . list each, $0.80

FLUE



Number	Description	Price List
1	Round wire, 3 inches diameter	$1.00
2	Round wire, 3 inches diameter, same as No. 1, except with 55-inch flexible wire handle . .	1.20
3	Flat tempered wire, 2 x 3¼-inch, oval sides .	1.30
4	Flat tempered wire, 3 x 4-inch, oval sides . .	1.40
5	Double brush, 1¾ x 4½ x 4 inches	1.50
6	Double brush, 2½ x 6 x 4 inches	2.00
7	Round end, fine wire, 1¼ inches diameter . .	1.00
8	Round end, fine wire, 1½ inches diameter . .	1.00

CAPITOL SECTIONAL COVERINGS

AIR CELL

THIS covering is made of strictly pure asbestos felt, so constructed as to contain numerous confined air cells, making it a perfect non-conductor unaffected by extreme heat; made in 3-foot lengths; ½, ¾ and 1 inch thickness.

WOOL FELT, FOR LOW PRESSURE STEAM

Is ¾ inch thick and lined with asbestos paper. This covering is used for low pressure steam work, and where an extra good covering is wanted for hot water pipes.

WOOL FELT, FOR HOT WATER

Same quality of goods as the above except in thickness. It is ½ inch thick and lined with asbestos paper. Considering the difference in time required for application, this covering is as cheap as hair felt and much better.

MOULDED ASBESTOS, FOR HIGH AND LOW PRESSURE STEAM

Is a covering made of the best non-conducting materials known, being a composition of magnesia, asbestos and the necessary binding materials. It is light in weight, tough and non-combustible.

For list prices on coverings, see opposite page.

CAPITOL SECTIONAL COVERINGS

PRICE LIST

Adopted August 1, 1907

Inside Diameter of Pipe Inches	Price per Lineal Foot	Elbows Each	Tees Each	Globe Valves Each
½	$0.22	$0.30	$0.36	$0.54
¾	.24	.30	.36	.54
1	.27	.30	.36	.54
1¼	.30	.30	.36	.54
1½	.33	.30	.36	.54
2	.36	.36	.42	.60
2½	.40	.42	.48	.78
3	.45	.48	.54	.96
3½	.50	.54	.60	1.20
4	.60	.60	.75	1.50
4½	.65	.72	.90	1.85
5	.70	.90	1.20	2.25
6	.80	1.30	1.60	2.80
7	1.00	1.80	2.20	3.60
8	1.10	2.40	3.00	4.40
9	1.20	3.00	3.80	5.30
10	1.30	3.60	4.60	6.20

CAPITOL PIPE JOINT CEMENT

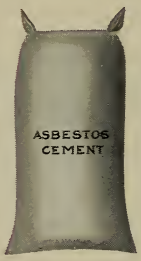
CAPITOL Pipe Joint Cement solves the problem of making positively air-tight joints. It is cheaper than red or white lead, and much superior. The joints can be very easily broken after long service without injury to the threads or pipe. Money, time and trouble will be saved by using this cement on all steam and hot water connections.

1-lb. cans, each . $0.60
5-lb. cans, each . 2.25
12½-lb. cans, each . $4.50
25 -lb. cans, each . 7.50

Special prices quoted on full barrel shipments

ASBESTOS PLASTIC CEMENT

FOR BOILERS HEATERS



FURNACES TANKS, ETC.

THIS cement is far superior to any other on the market. It is white and of lighter weight than ordinary asbestos cement felting, and is consequently a most perfect non-conductor of heat. The material is pure asbestos fibre, mixed with other high-grade fireproof insulating ingredients. It should be mixed to the consistency of ordinary mortar at least twenty-four hours before using. If properly applied, 150 pounds should cover 40 square feet of surface to the depth of one inch. Being large purchasers, we can supply the heating trade at very low figures, and as we keep a large stock on hand, can make prompt shipments. The cement is put up in 50, 75 and 100-pound bags.

Price per 100 pounds $3.50

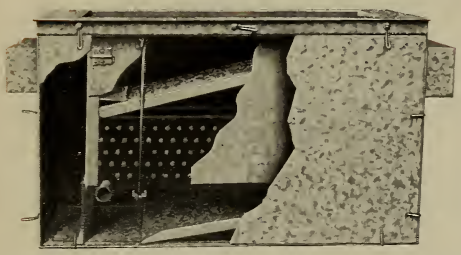
ASBESTOS BOILER PUTTY

Especially adapted for sealing openings in stoves and cast-iron boilers and as a protection for surfaces exposed to a direct fire.

Will not shrink or become porous.

5-lb. cans, per lb. list, $0.15	25-lb. cans, per lb. list, $0.10
10-lb. cans, per lb. list, .12	50-lb. cans, per lb. list, .08

CAPITOL INDIRECT RADIATOR CASINGS

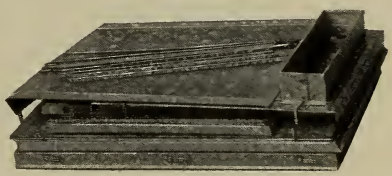


THE Capitol Indirect Radiator Casing is built so that the air is brought in direct contact with the entire radiator instead of passing around the sides and ends; consequently the efficiency of any indirect radiator is increased when this patented casing is used.

The air can be admitted at the side, bottom or ends, no cold air inlet being placed on the casing unless ordered, for the reason that it may be brought in at any one of the four places desired.

The parts of the casing are neither bolted nor riveted, but have tight fitting slip joints held in place by turn clips, making it easy of access so that it can be taken apart for repairs to the radiator or for the purpose of cleaning.

It is shipped "knocked down" in such a way that the entire casing can be put up in from fifteen to twenty minutes, which means a great saving of labor. It is made double throughout by its partitions, to retain the heat, has a 2-inch air space on the sides, and the ends are lined with sheet asbestos paper.



It is regularly made up with 24 or 26 gauge galvanized iron, with hangers furnished for all kinds of construction. The rods to carry the radiators vary in size according to their weight. Indirect radiators are supposed to hang 10 or 12 inches below the ceiling, with the same amount of space at the bottom of the casings, and hangers are sent out accordingly.

To obtain the cost, simply multiply the number of feet in the radiator by the price per foot. The following list includes necessary hangers and lag screws:

PRICE LIST

75 feet and under	$0.28 per foot
76 to 100 feet inclusive	.26 per foot
101 to 125 feet inclusive	.24 per foot
126 to 150 feet inclusive	.22 per foot
Over 150 feet	.20 per foot

Casings without inner side walls, but asbestos lined, can be furnished at a reduction of 4 cents per foot from above list prices.

Complete circular furnished on request.

BRASS POP SAFETY VALVES

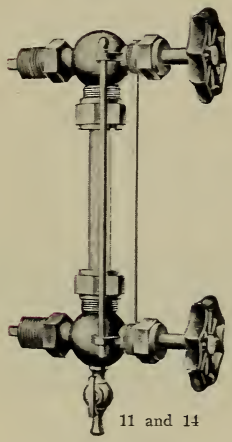
WITH IRON BASE

THIS low pressure pop safety valve is well proportioned and its construction includes all the features necessary to make it reliable and efficient. Regularly set at ten pounds but it can be easily adjusted to any pressure up to twenty pounds. Can be drilled for seal without extra cost.

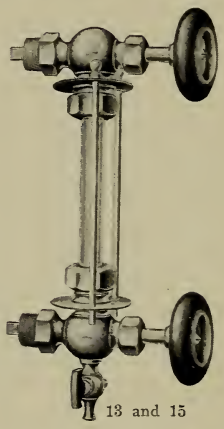
Size, inches	¾	1	1¼	1½	2	2½	3
Finished body	$10.00	$12.00	$15.00	$20.00	$30.00	$50.00	$65.00

BRASS WATER GAUGES

SELF-CLEANING



11 and 14



13 and 15

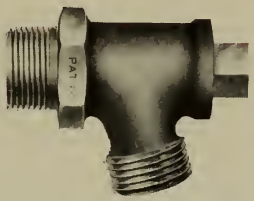
Number	Body	Wheels	Connections Iron Pipe Size, Inches	Size of Glass	List per Set
11	Rough, Bronzed	Iron	½	⅝ x 12	$3.00
13	Polished	Wood	½	⅝ x 12	4.25
14	Rough, Bronzed	Iron	¾	¾ x 16	4.50
15	Polished	Wood	¾	¾ x 16	5.50

COMPRESSION GAUGE COCKS

WITHOUT STUFFING BOX

No. 40 Wood Handle, threaded for iron pipe, ⅜-inch, list each. $0.85
No. 44 Wood Handle, threaded for iron pipe, ½-inch, list each, .90

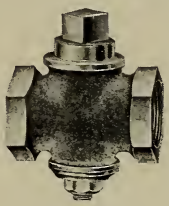
BOILER DRAW-OFF COCKS



THIS patent stop draw-off cock is made so that the plug cannot be removed. Furnished in ½ or ¾-inch sizes, with ¾-inch iron pipe connection for hose.

No. 70 ½-inch, list each $0.75
No. 71 ¾-inch, list each 75

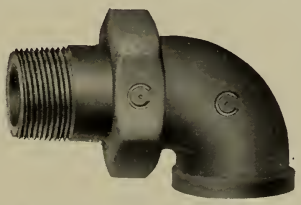
STANDARD BLOW-OFF COCKS



Iron Body, Brass Plug

Size, inches . . .	¾	1	1¼	1½	2	2½	3
No. 230, list each .	$1.60	$1.90	$2.65	$3.75	$5.25	$8.75	$13.00

CAPITOL MALLEABLE UNION ELBOWS

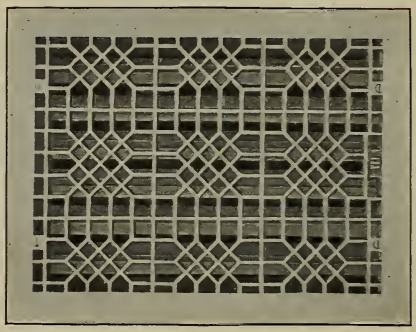


Male Union with Iron to Brass Joint

Size, inches	½	¾	1	1¼	1½	2
No. 40, list each . .	$0.48	$0.62	$0.72	$1.05	$1.20	$1.80

REGISTERS

FOR EITHER FLOOR OR WALL



STANDARD LIST

Size Inches	Black Japanned			Electro-plated in Nickel or Bronzed in Gold, Silver or Copper		
	Register	Register Face	Floor Border	Register	Register Face	Floor Border
6x8	$1.55	$1.00	$1.15	$2.80	$2.25	$2.40
6x10	1.60	1.05	1.20	3.00	2.45	2.60
6x12	1.85	1.25	1.45	3.50	2.90	3.10
8x10	1.65	1.10	1.25	3.15	2.60	2.75
8x12	1.90	1.30	1.50	3.65	3.05	3.25
9x12	2.10	1.45	1.65	4.00	3.35	3.55
9x15	3.95	2.65	2.65	6.50	4.90	5.20
10x12	2.40	1.70	1.75	4.40	3.70	3.75
10x14	3.15	2.20	2.20	5.25	4.30	4.30
10x16	4.85	2.95	2.95	7.20	5.30	5.30
12x14	4.35	2.80	2.80	6.85	5.35	5.35
12x15	4.50	2.90	2.90	7.00	5.40	5.40
12x16	5.60	3.50	3.50	8.25	6.15	6.15
12x18	6.80	3.90	3.90	9.55	6.65	6.65
12x19	7.50	4.00	4.00	10.35	6.85	6.85
14x16	8.50	4.30	4.30	11.50	7.30	7.30
14x18	9.00	4.50	4.50	12.00	7.50	7.50
14x20	9.50	4.80	4.80	13.00	8.50	8.50
16x18	12.00	5.30	5.30	16.20	9.50	9.50
16x20	12.35	6.10	6.10	16.55	10.30	10.30
16x22	14.75	6.70	6.70	19.50	11.50	11.50
16x24	15.00	7.00	7.00	20.00	12.00	12.00
18x21	20.50	7.75	7.75	26.00	13.25	13.25
18x24	21.50	8.35	8.35	27.75	14.60	14.60
20x24	22.00	8.60	8.60	28.20	14.80	14.80
20x26	23.50	9.50	9.50	32.00	17.50	17.50
20x30	33.50	13.50	13.50	43.00	23.50	23.50
24x30	38.00	17.25	17.25	50.00	29.25	28.25
24x36	50.00	22.00	22.00	65.50	37.50	34.25
30x36	67.50	28.50	28.50	90.00	51.00	41.00
30x42	77.50	33.00	29.00	102.00	57.50	50.50

Ventilator for cords, 50 cents list extra on sizes up to 14 x 14, and $1.00 list extra on sizes above.

Write for price on any regular sizes not listed.

STEEL TOOL CHESTS

MADE from $\frac{1}{16}$-inch cold rolled steel with malleable iron corner pieces and hardwood braces; fitted with heavy wrought iron hinges and hasps. Each steel chest is furnished with a first-class lock and two keys and bolts to screw down cover at front corners.

Number	Depth Inches	Width Inches	Length Inches	Description	Weight Pounds	List
711	11	12	24	One drawer	60	$12.50
712	14	15	30	One drawer	95	17.00
713	16	17	36	One drawer	125	19.00
721	11	12	24	Two drawers	65	14.00
722	14	15	30	Two drawers	100	18.50
723	16	17	36	Two drawers	130	20.50
701	11	12	30	Without drawer	70	12.50
702	11	12	36	Without drawer	105	15.00
703	11	12	42	Without drawer	140	17.00
704	11	12	48	Without drawer	180	20.00

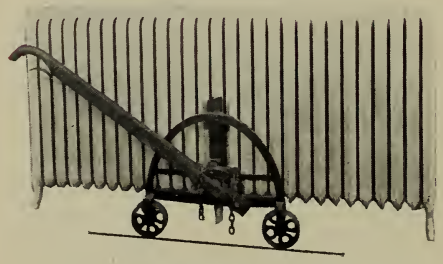
WOOD TOOL CHESTS

MADE of selected seasoned lumber throughout. All corners protected by heavy iron. Stationary till at one side for small tools. No. 789 has strong spring lock while No. 790 has two heavy hasps for padlock.

Number	Depth Inches	Width Inches	Length Inches	Weight Pounds	List
789	12	16	24	50	$12.50
790	12	16	36	60	18.50

CAPITOL RADIATOR TRUCK

MADE IN TWO HALVES



Patented February 12, 1907

THE value of the Capitol Radiator Truck will be at once apparent to every contracting steam fitter. Instead of two, three, four and even six men tugging at different sizes and shapes of radiators, one man can easily handle and move the heaviest one. It needs absolutely no adjustment and can be operated more quickly and easily than any other article of its kind.

By using this truck, the radiator can be easily moved through the narrowest doorway, behind counters, under stairways or into the oddest corners of a room.

Can be furnished with either plain wheels for ordinary work, or rubber tire wheels where it is necessary to move radiators over the finest floors of wood or tile, without any danger of damaging them.

Made in one size only to fit all radiators.

Each truck is thoroughly tested and guaranteed to do the work as represented. The frames of these trucks are made of malleable iron, thereby insuring a truck that will stand the wear and tear occasioned through rough handling and constant use. Weight, 70 pounds.

Plain wheels	price each	$25.00
Rubber tire wheels	price each	30.00

CAPITOL SPUD WRENCHES

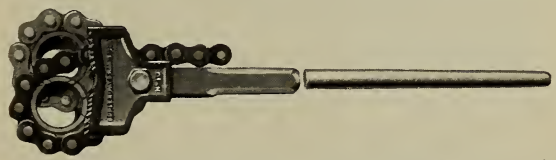
WITH this wrench, connections for radiator valves and elbows can be quickly made tight, without danger of injuring the union. Arranged to fit unions on ¾-inch, 1-inch, 1¼-inch and 1½-inch sizes. Price each list $0.60

CROWN PIPE CUTTERS

These pipe cutters are equipped with patented notched edge wheel, which saves one-half the time and labor in cutting, on account of their clearance. All wearing parts are well supported, with the pins and wheels made of the best tool steel. Numbers two and three cutters have a tapped hole in bottom of frame, which allows operator to screw in a piece of pipe to be used as an extra handle if desired.

Numbers	1	2	3
Cut pipe, inches	⅛ to 1	¾ to 2	2½ to 4
List each	$3.00	$5.00	$12.00

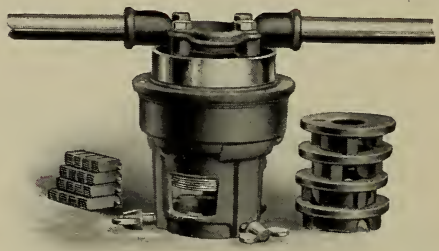
DUPLEX CHAIN WRENCHES



The chain of the Duplex has a greater encircling contact with the pipe than is obtained by any other wrench. It releases and reverses itself instantly for turning either way by operation of the wrench, without adjustment; the jaws, chain and handle being so constructed as to insure proper distribution of the teeth on the pipe at all times.

Numbers	12	13	14	15
List price, with flat link chain	$5.00	$7.00	$11.00	$18.00
Capacity, size pipe . . .	¼ to 2½	¾ to 4	1½ to 8	2 to 12
Length over all, inches . .	27	38	57	65
Weight, pounds	9	16	29	54

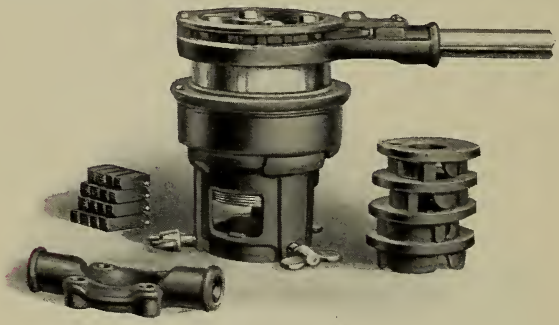
SANDUSKY STOCKS AND DIES



No. 1

No. 1 Threads, 1, 1¼, 1½ and 2 inches. Price complete, $24.00
No. 0 Threads, ¼, ⅜, ½ and ¾ inch. Price complete, 20.00

THERE is no lead screw used for ¼ or ⅜-inch sizes in the No. 0 machine. This is the most convenient adjustable machine of small size on the market.



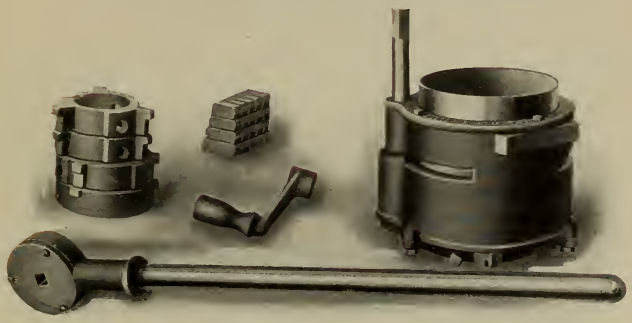
1-B Ratchet Stock

No. 1–B Threads, 1, 1¼, 1½ and 2 inches. Price complete, $30.00

Can be furnished with plain driver and handle in addition to ratchet shown.

All parts of Sandusky pipe-threading machines are of malleable iron or steel, so that the greatest strength is secured. The dies or chasers are narrow in shape, to minimize friction, and may be ground on ordinary emery or sandstone to one-half size without affecting the cutting qualities. Proper clearance and form is given each die for ease of cutting and durability, an important advantage over machines with a single set of dies. The guided die holder eliminates lead screw trouble. When thread is cut the dies *automatically release* themselves from the pipe (except on No. 0), permitting the withdrawal of machine without backing off.

SANDUSKY STOCKS AND DIES



No. 2 Geared Stock

THREADS 2½, 3, 3½ and 4-inch pipe in 6-inch radius. It is the lightest portable machine, and yet the strongest, for this range of work. Weight of machine proper, without ratchet handle, 60 pounds.

No. 2 Sandusky Machine . . . . . price complete $100.00

All No. 2 machines are arranged to permit their attachment to either bench or floor stand. Machine can be quickly removed from either stand and used with common vise or on a fixed line of pipe.

Bench Stand for No. 2 Sandusky Machine . price complete $20.00
Floor Stand for No. 2 Sandusky Machine . price complete 30.00

SANDUSKY NIPPLE HOLDERS

MEET a long felt want and are an essential accessory to any leader screw machine. Will cut close or any length of nipple.

No. 0 Nipple Holder has range of ⅛, ¼, ½ and ¾-inch, price $4.00
No. 1 Nipple Holder has range of 1, 1¼, 1½ and 2 inches, price 8.00
No. 2 Nipple Holder has range of 2½, 3, 3½ and 4 inches, price 20.00

BOILER REPAIRS

SUGGESTIONS FOR ORDERING

THE following lists give complete prices of parts for all boilers listed in the preceding pages.

A special repair list pamphlet will be issued containing prices on parts of all old style boilers as formerly made by the constituent Companies of this Corporation.

INFORMATION NEEDED WHEN ORDERING REPAIRS

When ordering repairs, describe as plainly as possible the casting or piece desired, giving *size number* and *factory number* of boiler, both of which will be found either cast on front or on brass plate screwed on front of all boilers.

It is important that these numbers be given on order to obtain prompt attention and shipment.

As letters or numbers are cast on many boiler parts to designate change in pattern, they should also be mentioned on order when found on casting.

In case it is impossible to give boiler numbers, a sketch having dimensions marked, should accompany a detailed written description of part wanted.

In addition to the above, the following information will give much assistance to us when filling orders.

In what year was boiler installed? By whom was it installed? What are number or letter marks on the boiler? Is boiler round or square?

If a SQUARE BOILER, what is width of boiler section across widest part at front? What is total height from bottom of boiler base to top of supply tapping? How many grate bars in boiler? What is the length of grate bars? Are grate bars connected by a bolt and nut or by hook cast in bar?

If a ROUND BOILER, how many grate bars in set? What is extreme length of center grate bar? Are grate bars connected by a bolt and nut or by hook cast in bar? If boiler has triangular grate bars, are they hung in a separate ring on base or by small, loose hangers? Does the grate have a center rest underneath?

REPAIRS FOR CAPITOL IMPROVED BOILERS

PRICE LIST

Boiler Number	Top Header	Cored Base R or L	Sub-base Side	Connecting Rods "R"	Connecting Rods "L"
425, 1425	$14.00	$17.00	$7.00	$1.00	
525, 1525	17.00	19.00	8.50	1.10	
625, 1625	20.00	21.00	10.00	1.50	$1.10
725, 1725	23.00	23.00	11.50	2.20	1.10
825, 1825	26.00	25.00	13.00	2.60	1.40
537, 1537	35.00	30.00	9.00	1.00	1.20
637, 1637	40.00	35.00	10.50	1.20	1.60
737, 1737	45.00	40.00	12.00	1.20	2.30
837, 1837	50.00	45.00	13.50	1.40	2.70
937, 1937	55.00	50.00	15.00	1.50	3.40
1037, 2037	60.00	55.00	16.50	1.80	3.80
748, 1748	95.00	60.00	16.50	2.50	1.50
848, 1848	110.00	65.00	18.00	3.00	2.00
948, 1948	125.00	70.00	19.50	3.50	2.00
1048, 2048	140.00	75.00	21.00	4.00	2.50
1148, 2148	150.00	80.00	22.50	4.50	2.50
1248, 2248	160.00	85.00	24.00	4.50	2.50
1348, 2348	170.00	90.00	25.50	4.50	2.50

Name of Parts	Series			
	25 Water	25 Steam	37	48
Back half section, R or L	$23.00	$25.00	$48.00	$80.00
Front half section, R or L	21.00	23.00	42.00	80.00
Intermed. half sect., R or L	19.00	20.00	35.00	58.00
Flue half section, R or L	18.00	19.50	34.00	57.00
Skeleton half sect., R or L	16.00	18.00	28.00	48.00
Area half section, R or L	. .	. .	35.00	57.00
Ash-pit front	12.00	12.00	15.00	L 15.00 R 15.00
Ash-pit door	2.40	2.40	2.50	4.00
Ash-pit drop door . .	1.00	1.00	1.00	1.40
Ash-pit drop ratchet . .	1.00	1.00	1.00	1.00
Ash-pit handle . . .	1.00	1.00	1.00	1.00
Connecting rod support .	1.00	1.00	1.00	1.00
Center strip	1.00	1.00	1.00	1.00
Cleanout door, R or L .	1.00	1.00	2.00	4.00
Cleanout door lining . .	1.00	1.00	1.40	2.00
Clinker door	1.00	1.00	1.00	1.00
Clinker door lining . .	1.00	1.00	1.00	1.00
Clinker door handle . .	1.00	1.00	1.00	1.00
Fire door frame . . .	4.50	4.50	6.00	
Fire door only . . .	3.00	3.00	3.50	4.50
Fire door lining . . .	1.30	1.30	1.50	3.50
Fire door handle . . .	1.00	1.00	1.00	1.00
Fire door slide . . .	1.00	1.00	1.00	1.00

CAPITOL IMPROVED BOILERS—*Continued*

PRICE LIST

Name of Parts	Series			
	25 Water	25 Steam	37	48
Fire door pin	$1.00	$1.00	$1.00	$1.00
Front distance piece	2.40	2.40	3.50	8.50
Grate bar, "coarse"	5.50	5.50	8.00	15.00
Grate bar, pea coal	5.50	5.50	9.00	15.00
Hinge plate	1.00	1.00	1.00	1.00
Latch plate	1.00	1.00	1.00	1.00
Shaker slide	1.00	1.00	1.00	1.00
Shaker bracket	1.00	1.00	1.00	1.00
Shaker arm	1.00	1.00	1.50	1.50
Shaker handle	1.20	1.20	1.50	1.50
Shaker link	1.00	1.00	1.00	1.00
Sub-base end	6.00	6.00	9.00	10.00
Smoke hook entire	10.80	10.80	19.00	24.00
Smoke hood only	8.00	8.00	15.00	18.00
Smoke hood check door	1.00	1.00	1.00	2.00
Smoke hood indicator plate	1.00	1.00	1.00	1.00
Smoke hood indicator catch	1.00	1.00	1.00	1.00
Smoke hood damper	1.40	1.40	2.00	2.00
Upper push nipple	1.00	1.00	1.00	1.00
Lower push nipple	1.00	1.00	1.00	1.00
Base push nipple	1.00	1.00	1.00	1.00
Rods, upper or lower	1.00	1.00		

CAPITOL SOLAR BOILERS—Improved

Boiler Number	Flue Door	Flue Door Lining	Flue Door Frame	Boiler Number	Flue Door	Flue Door Lining	Flue Door Frame
702	$1.00	$1.00	$1.00	1804	$2.40	$1.60	$2.80
1002	1.00	1.00	1.00	1805	3.60	2.00	3.00
1003	1.30	2.00	1.50	2403	1.60	1.20	2.00
1004	1.50	1.00	1.60	2404	2.40	1.60	2.50
1402	1.50	1.00	1.60	2405	3.60	2.00	3.00
1403	1.70	1.00	2.00	3303	1.70	1.20	2.00
1404	2.20	1.20	2.80	3304	2.50	1.60	2.50
1803	1.60	1.20	2.00	3305	3.60	2.00	3.00

Name of Parts	Series Numbers				
	100	140	180	240	330
Intermediate section	$22.00				
Outer hole section		$28.00	$32.00	$39.00	$48.00
Center hole section		26.00	30.00	38.00	
Outer and center section		28.00	32.00	38.00	48.00
Top header, water	22.00	28.00	32.00	38.00	48.00
Top header, steam	30.00	46.00	55.00	75.00	90.00

CAPITOL SOLAR BOILERS—Improved

PRICE LIST—*Continued*

Name of Parts	Serial Numbers				
	100	140	180	240	330
Ash-pit base, old style	$16.00				
Ash-pit base, present style	14.00	$24.00	$28.00	$32.00	$40.00
Fire-pot, old style	60.00	80.00	105.00	130.00	150.00
Fire-pot, present style	65.00	90.00	110.00	135.00	160.00
Ash-pit front	2.80	3.50	4.00	4.80	5.50
Ash-pit door	1.00	2.00	2.00	3.00	3.00
Ash-pit drop door	1.00	1.00	1.00	1.00	1.00
Clinker door	1.00	1.00	1.00	1.00	1.00
Clinker door frame	1.00	1.00	1.30	1.50	1.50
Clinker door lining	1.00	1.00	1.00	1.00	1.00
Clinker door handle	1.00	1.00	1.00	1.00	1.00
Fire door	1.50	2.00	2.00	2.20	2.80
Fire door frame	2.50	2.50	3.00	3.50	4.00
Fire door lining	1.00	1.20	1.20	1.20	1.40
Fire door handle	1.00	1.00	1.00	1.00	1.00
Fire door vent	1.00	1.00	1.00	1.00	1.00
Grate ring	5.00	6.00	8.00	10.50	11.50
Grate bars, 1st	1.60	3.20	3.50	3.50	3.50
Grate bars, 2nd	2.00	3.60	4.00	5.00	5.50
Grate bars, 3rd	1.60	3.20	3.50	5.00	6.00
Grate bars, 4th	. .	. .	. .	3.50	5.50
Grate bars, 5th	. .	. .	. .	. .	3.50
Smoke hood, entire	4.00	6.50	8.30	9.90	12.60
Smoke hood only	1.80	3.60	5.00	6.00	8.00
Smoke hood check door	1.00	1.00	1.00	1.00	1.00
Smoke hood, lower half	1.00	1.00	1.20	1.40	1.60
Smoke h'd check d'r frame	1.00	1.00	1.00	1.00	1.00
Smoke hood damper	1.00	1.00	1.00	1.20	1.60
Smoke hood ratchet	1.00	1.00	1.00	1.00	1.00
Smoke hood catches	1.00	1.00	1.00	1.00	1.00
Smoke hood rod	1.00	1.00	1.00	1.00	1.00
Smoke hood handle	1.00	1.00	1.00	1.00	1.00
Connecting rods	1.00	1.00	1.00	1.00	1.00
Shaker offset rod	1.00	1.00	1.00	1.00	1.00
Shaker arm	1.00	1.00	1.00	1.00	1.00
Shaker handle	1.50	1.50	1.50	1.50	1.50
Shaker catch	1.00	1.00	1.00	1.00	1.00
Shaker arm support	1.00	1.00	1.00	1.00	1.00
Grate ring wedge	1.00	1.00	1.00	1.00	1.00
Shaker plate	1.00	1.00	1.00	1.00	1.00
Push nipple	1.00	1.00	1.00	1.00	1.00
	2-Section	3-Section	4-Section	5-Section	6-Section
Bolt	.20	.30	.40	.50	.60

When ordering parts for these boilers be sure to mention size and serial numbers found on front of boiler.

See note page 174.

REPAIRS FOR FURMAN SECTIONAL BOILERS

PRICE LIST

Name of Part	Series Number				
	180	220	270	330	380
Front section	$43.00	$58.00	$74.00	$88.00	$147.00
Intermediate section	38.40	56.00	74.00	84.00	141.80
Back section	46.50	64.00	88.50	100.00	171.00
Front base plate	3.80	4.40	6.20	8.20	16.00
Side base plate (1-grate)	1.80	1.80	2.40	3.40	4.00
Side base plate (2-grate)	4.60	4.60	6.60	6.60	11.20
Side base plate (3-grate)	. .	. .	. .	9.20	17.00
Side base plate (4-grate)	7.40	7.40	10.40	11.40	
Back base plate	4.40	5.20	7.20	9.60	16.00
Front base plate caps	1.00	1.00	1.00	1.00	
Ash-pit door	1.60	1.60	1.80	1.70	3.00
Draft door	1.00	1.00	1.00	1.00	4.00
Front and rear half grate bar	1.20	1.80	2.20	2.80	5.80
Intermediate grate bar	3.00	3.80	4.80	7.00	16.00
Grate lugs	1.00	1.00	1.00	1.00	
Connecting bar (1-grate)	1.00	1.00	1.00	1.00	1.00
Connecting bar (2-grate)	1.00	1.00	1.00	1.00	1.20
Connecting bar (3-grate)	1.40	1.40	1.40	1.40	2.20
Connecting bar (4-grate)	1.60	1.60	1.60	1.80	2.50
Shaker handle	1.60	1.60	1.80	1.80	3.60
Clinker door	1.00	1.00	1.00	1.00	1.00
Clinker door lining	1.00	1.00	1.00	1.00	1.00
Clinker plate	1.10	1.20	1.60	2.00	3.00
Fire door	1.80	1.80	1.80	2.80	3.00
Fire door lining	1.20	1.40	1.40	2.20	1.80
Fire lugs	1.00	1.00	1.00	1.00	
Cleanout door, R. or L.	1.20	1.60	2.20	2.20	1.40
Cleanout door, R. or L. lining	1.00	1.20	1.20	1.70	1.00
Cleanout door lugs	1.00	1.00	1.00	1.00	
Cleanout door center	. .	. .	. .	. .	1.40
Cleanout door center lining	. .	. .	. .	. .	1.00
Furman sectional name plate	1.00	1.00	1.00	1.40	1.40
Coil plate	1.00	1.00	1.00	1.00	1.00
Baffle plate	1.00	1.00	1.00	1.00	1.25
Water back	10.00	10.00	10.00	10.00	10.00
Smoke ell, R. H.	2.60	3.20	4.40	5.40	15.00
Smoke ell, L. H.	3.00	3.60	5.20	6.00	15.00
Smoke ell, damper	1.00	1.00	1.40	1.40	2.40
Check frame	1.00	1.00	1.00	1.00	1.00
Check door	1.00	1.00	1.00	1.00	1.00

When ordering parts for boilers, be sure to mention size and serial numbers found on front section.

See notes on page 174.

REPAIRS FOR FURMAN ROUND SECTIONAL BOILERS

PRICE LIST

Name of Part	Series Number				
	16-inch	19-inch	22-inch	25-inch	29-inch
Base	$14.00	$16.00	$19.00	$20.60	$37.00
Front base plate	. .	2.60	3.00	3.60	
Front base, upper half	1.00	. .	. .	. .	2.20
Front base, lower half	1.00	. .	. .	. .	3.80
Ash-pit door	1.60	2.00	2.00	2.00	2.00
Draft door	1.00	1.00	1.00	1.00	1.00
Draft door ratchet	1.00	1.00	1.00	1.00	1.00
Short grate bar	1.20	1.60	1.80	1.60	2.00
Short grate bar, new style	. .	2.50	3.10	2.70	3.40
Medium grate bars	. .	. .	. .	2.40	3.00
Medium grate bars, new style	. .	. .	. .	3.40	4.20
Long grate bar	1.80	2.00	2.40	3.00	3.80
Long grate bar, new style	. .	2.80	3.60	3.60	4.20
Grate bar gear	1.00	1.00	1.00	1.00	1.00
Grate bar gear, new style	1.00	1.00	1.00	1.00	1.00
Grate bar washer	1.00	1.00	1.00	1.00	1.00
Grate ring	3.80	5.00	5.60	5.00	8.00
Grate ring, new style	. .	4.20	5.00	5.40	8.00
Grate bar hanger	1.00	1.00	1.00	1.00	1.00
Back hanger, new style	. .	1.00	1.20	1.60	1.80
Shaker handle	1.00	1.00	1.00	1.00	1.00
Shaker handle, new style	. .	1.00	1.00	1.00	1.00
Gear back, new style	. .	1.40	1.50	1.90	2.20
Gear back lugs	. .	1.00	1.00	1.00	1.00
Grate rest, new style	. .	. .	. .	1.60	1.70
Grate rest lugs, new style	. .	. .	. .	1.00	1.00
Fire-pot	58.00	83.50	96.00	118.00	142.00
Clinker door	1.00	1.00	1.00	1.00	1.00
Clinker door frame	1.00	1.00	1.00	1.00	1.00
Clinker door lining	1.00	1.00	1.00	1.00	1.00
Fire door	1.00	1.60	1.60	1.60	1.60
Fire door frame	1.60	2.00	1.60	1.80	1.80
Fire door lining	1.00	1.00	1.00	1.00	1.00

Made at Geneva plant

REPAIRS FOR FURMAN ROUND SECTIONAL BOILERS—*Continued*

PRICE LIST

Name of Part	Series Number				
	16-inch	19-inch	22-inch	25-inch	29-inch
Fire-door wheel	$1.00	$1.00	$1.00	$1.00	$1.00
Ring "B" section	16.00	19.50	21.00	28.00	40.00
Ring "C" section	16.00	19.50	21.00	28.00	40.00
No ring cleanout door	1.00	1.00	1.00	1.00	1.00
No ring cleanout frame	1.00	1.00	1.00	1.00	1.00
One-ring cleanout door	1.00	1.00	1.00	1.00	1.00
One-ring cleanout frame	1.20	1.20	1.20	1.20	1.40
Two-ring cleanout door	1.40	1.60	1.60	1.60	1.60
Two-ring cleanout frame	1.50	1.40	1.60	1.40	1.60
Three-ring cleanout door	. .	. .	. .	. .	1.80
Three-ring cleanout frame	. .	. .	. .	. .	2.20
No. 1 cleanout frame, new style	. .	1.00	1.00	1.00	1.00
No. 2 cleanout frame, new style	. .	1.00	1.00	1.00	1.00
No. 3 cleanout frame, new style	. .	. .	. .	. .	1.00
Cleanout door, new style	. .	1.00	1.00	1.00	1.00
Dome, steam	29.20	39.20	45.00	53.00	69.00
Dome, water	19.00	27.00	34.50	43.50	55.00
Smoke ell	2.20	2.60	3.20	4.40	5.00
Check door	1.00	1.00	1.00	1.00	1.00
Check door ratchet	1.00	1.00	1.00	1.00	1.00
Damper	1.00	1.00	1.00	1.00	1.00
Damper ratchet	1.00	1.00	1.00	1.00	1.00
Damper ratchet handle	1.00	1.00	1.00	1.00	1.00
Smoke box, old style	. .	1.60	2.20	2.40	
Smoke box cap, old style	. .	1.00	1.00	1.00	
Smoke box damper	. .	1.00	1.00	1.00	
Check doors	. .	1.00	1.00	1.00	
Check door frames	. .	1.00	1.00	1.00	
Water back	10.00	10.00	10.00	10.00	10.00

When ordering parts for boilers be sure to mention size and serial numbers found on front of boiler.

See notes on page 174.

REPAIRS FOR SUNRAY BOILERS

PRICE LIST

Name of Part	Series Number				
	50 E	90 A	320	230	270
Front section	$47.00	$50.00	$90.00	$100.00	
Front half section (R or L) ea.	. . .	. . .	. . .	. . .	$85.00
Intermediate section	35.50	40.00	70.00	90.00	
Intermediate half section (R or L) each	. . .	. . .	. . .	. . .	75.00
Tapped section	35.50	40.00	70.00	90.00	
Tapped half section, each	. . .	. . .	. . .	. . .	75.00
Next to back section	. . .	. . .	90.00		
Back section	50.50	50.00	90.00	100.00	
Back half section (R or L) ea.	. . .	. . .	. . .	. . .	85.00
Base front plate	4.50	5.50	4.50	16.00	28.00
Base back plate	6.00	5.50	7.50	10.00	20.00
Base side plate (1-sec. blank)	2.00	2.00	2.25	3.00	6.00
Base side plate (1-sec. draft opening)	2.00	. . .	. . .	3.00	
Base side plate (4-section)	8.00				
Base side plate (5-section)	10.00	10.00	. . .	12.50	25.00
Base side plate (5-sec., draft opening)	. . .	. . .	. . .	. . .	23.00
Base side plate (6-section)	12.00	12.00	12.00	15.00	30.00
Base side plate (7-section)	14.00	14.00	14.00	17.50	35.00
Base side plate (8-section)	16.00	16.00	16.00	20.00	40.00
Base side plate (9-section)	. . .	18.00	18.00	22.50	45.00
Base side plate (10-section)	. . .	. . .	20.00	25.00	50.00
Base side draft door frame	1.25	. . .	. . .	3.00	6.50
Base side draft door	1.00	. . .	. . .	1.00	2.00
Base back covering plate	1.00	1.00	1.00	1.00	
Back corrugated plate	. . .	. . .	7.00		
Back plain plate	. . .	. . .	9.00		
Ash-pit door	3.70	3.00	4.00	4.25	5.00
Ash-pit door flap	1.00	1.00	1.00	1.20	1.20
Ash-pit door slide	1.00	1.00	1.00	1.00	1.00
Regular intermed. grate bar	3.00	4.00	6.00	10.00	19.00
Half grate bar	1.75	2.50	4.50	4.50	7.50
Grate rest, per section	. . .	1.00	1.00		
Short connecting link	1.00	1.00	1.00	1.00	1.25
Long connect. link, per hole	.50	.50	.75	1.00	1.00
Front short connecting bar	. . .	. . .	. . .	1.40	1.75
Shaker shank	1.00	1.20	1.20	2.60	4.00
Shaker shank bolt	1.00	1.00	1.00	1.00	1.00
Shaker rest	1.00	1.00	1.00	1.50	1.75
Shaker rest bolt	1.00	1.00	1.00	1.00	1.00
Shaker handle	1.50	1.50	1.75	2.00	
Fire door	2.25	3.00	3.50	4.50	4.25
Fire door lining	1.50	1.30	1.40	1.70	2.00

Made at West Newton plant

REPAIRS FOR SUNRAY BOILERS—*Continued*

Name of Part	Series Number				
	50 E	90 A	320	230	270
Fire door frame	$4.55	$3.50	$3.50		
Fire door wheel	1.00	1.00	1.00	$1.00	$1.00
Cleanout doors, upp. front, ea.	3.80	4.00	3.50	2.50	9.00
Cleanout doors, lower front	...	...	...	...	2.50
Cleanout doors, lower front (R or L) lining	...	...	...	...	1.25
Cleanout door frame	3.90	4.00	8.00		
Clinker door (R or L)	...	...	...	1.00	1.00
Clinker door lining (R or L)	...	...	...	1.00	1.00
Strip for boiler front	...	...	...	...	2.00
Half smoke box, check opn'g	3.40	3.50	...	3.50	23.00
Half smoke box, blank	3.40	3.50	...	3.50	21.00
Smoke box	...	...	10.50		
Smoke box cap	...	2.00	...	2.00	
Smoke box collar	...	1.50			
Smoke box damper	1.00	1.20	1.20	1.20	5.00
Smoke box damper gauge	1.00	1.00	1.00	1.00	
Smoke box damper pin	1.00	1.00	1.00	1.00	1.00
Smoke box damper handle	1.00	1.00	1.00	1.00	1.00
Smoke box check frame	1.00	1.20	1.00	3.00	1.00
Smoke box check door	1.00	1.00	1.00	1.00	1.00
Damper gauge catch	1.00	1.00	1.00	1.00	1.00
Indirect damper	...	1.75			
Baffle plates	...	1.00	3.50		
Number plate	1.00	1.00	1.00	1.00	1.00
Water column	3.00	3.50	3.50		
Cast washers (lge., med., small)	1.00	1.00	1.00	1.00	1.00
3-inch slip nipples	1.00	1.00	1.00	1.00	1.00
4-inch slip nipples	1.00	1.00	1.00	1.00	1.00
6-inch slip nipples	1.20	1.20	1.20	1.20	1.20
Diaphragm	3.50	3.50	3.50	3.50	3.50
Diaphragm lever	1.20	1.20	1.20	1.20	1.20
Diaphragm weight	1.20	1.20	1.20	1.20	1.20
Diaphragm connecting pipe	1.00	1.00	1.00	1.00	1.00
Door handles, each	1.00	1.00	1.00	1.00	1.00
Catches, each	1.00	1.00	1.00	1.00	1.00
Hinge pins, each	1.00	1.00	1.00	1.00	1.00
Scraper	1.00	1.50	2.00	3.00	3.00
Flue brush with handle	2.00	3.50	3.50	3.50	3.50
Smoke box, complete	...	8.00	14.50	9.00	
Coil plate	...	...	1.00		
Hinge straps for doors, each	...	...	...	1.00	1.25
Name plate	...	...	...	...	2.00

When ordering parts for these boilers, be sure to mention size and serial numbers found on front section.

Note—Repairs for above series are the same as Sun and Sunray, as follows: 50 E same as Sun 20 series; 90 A same as 24 and 24 B Sun and 70 and 90 Sunray series; 320 same as 32 and 32 B series Sun and 800 series Sunray; 230 and 270 series not shown in former catalogues.

WALL RADIATORS

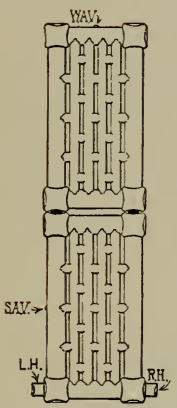


FIG. 1. Vertical. Two sections in two rows. Water or steam.

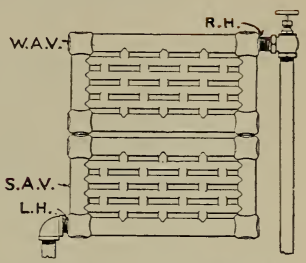


FIG. 2. Horizontal. Two sections in two rows. Water or steam.

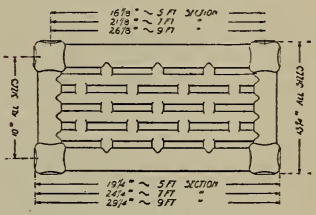


FIG. 3. Dimensions.

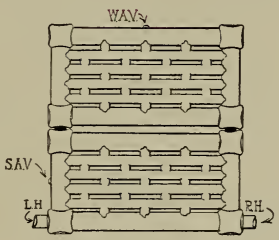


FIG. 4. Horizontal. Two sections in two rows. Water or steam.

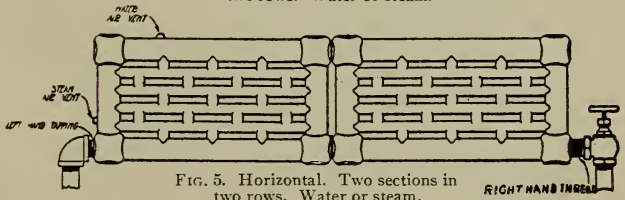


FIG. 5. Horizontal. Two sections in two rows. Water or steam.

Athenian Wall Radiators are tapped 1½ inches, supply and return, and are bushed per tapping list on page 121.

For further directions, see page 123.

WALL RADIATORS—*Continued*

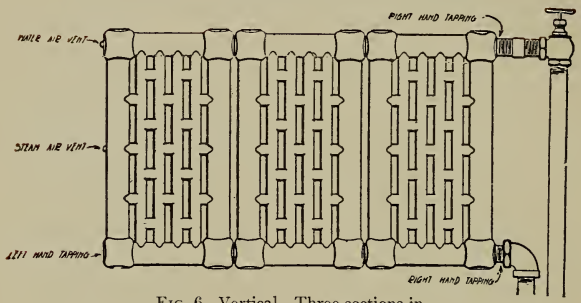


FIG. 6. Vertical. Three sections in one row. Water or steam.

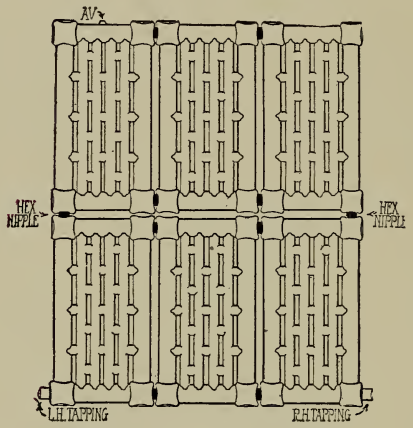


FIG. 7. Vertical. Six sections in two rows. Water only.

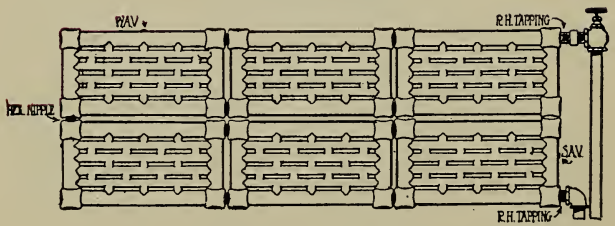


FIG. 8. Horizontal. Six sections in two rows. Water only.

WALL RADIATORS—*Continued*

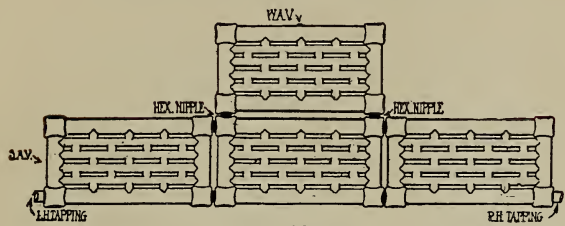


FIG. 9. Horizontal. Four sections with two rows in center. Steam or water.

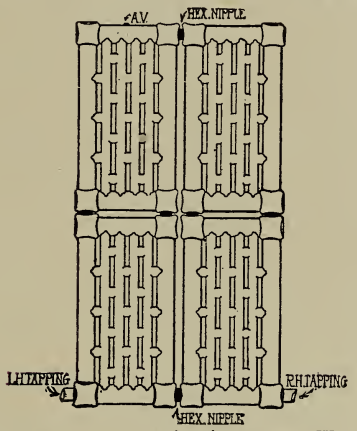


FIG. 10. Vertical. Four sections in two rows. Water only.

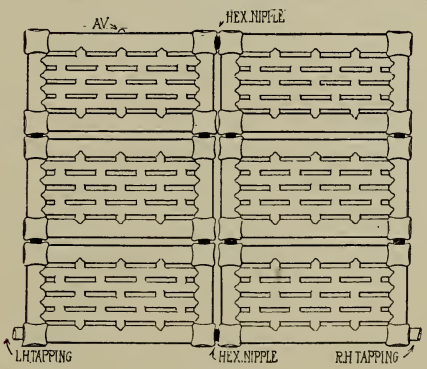


FIG. 11. Horizontal. Six sections in three rows. Water only.

WALL RADIATORS—*Continued*

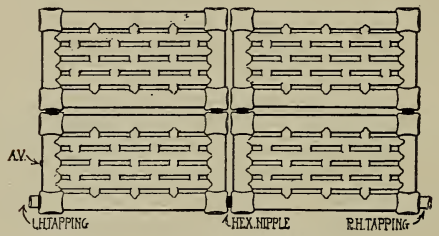


FIG. 12. Horizontal. Four sections in two rows. Steam only.

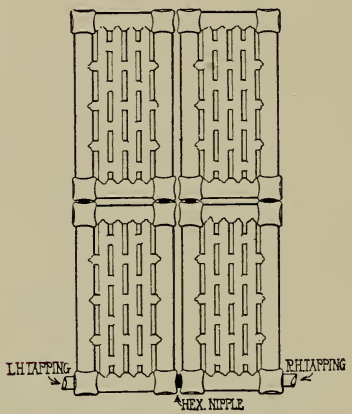


FIG. 13. Vertical. Four sections in two rows. Steam only.

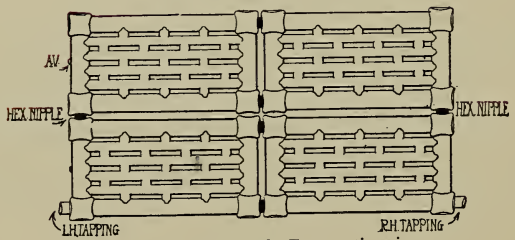


FIG. 14. Horizontal. Four sections in two rows. Water only.

WALL RADIATORS—*Continued*

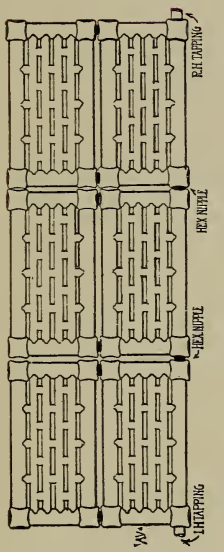


FIG. 15. Horizontal. Six sections in two rows. Steam only.

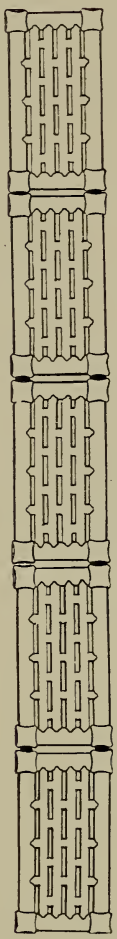


FIG. 16

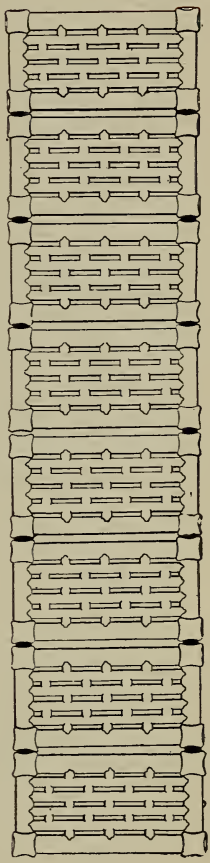


FIG. 17

Figs 16 and 17 illustrate method of connecting long radiators for steam. Every third or fourth section should be plugged at top and connected at bottom only.

RADIATOR REPAIRS

IN ordering repairs for radiators, much time and annoyance will be saved if the order clearly states fully all details of part wanted. Many times an incomplete description or lack of sketch showing details of part wanted makes it necessary for several letters to pass back and forth before the proper shipment can be made.

When the part is for a radiator of special construction, a sketch should also accompany written description on order.

When ordering radiator sections mention the following: Name of radiator, pattern of radiator, height of radiator, whether end leg section, center leg section, or regular intermediate section, and if supply or return end leg section or blank end leg section (for one-pipe steam) is wanted, also state if for steam or water, one or two-pipe work, slip nipple or screw nipple connection and high or low drip hubs. If water radiators are being used for steam this fact should also be mentioned.

Orders for indirect radiator repairs should clearly state whether end or intermediate section is wanted and whether blank or tapped when an end section. A sketch of section showing position of desired tappings, should be sent with order. Also state whether slip nipple or screw nipple connection is wanted.

SPECIAL NOTE

Repairs for radiators not illustrated in this catalogue will be charged at higher prices than standard goods.

HEATING WATER IN TANKS AND POOLS

SIZE OF HEATER

IN specifying heaters for any given capacity be sure to see that one is provided that will burn the fuel economically. If the heater is too small, the fire will have to be forced and a large percentage of the heat will escape up the chimney.

Many mistakes are made and much disappointment occasioned by not carefully considering the actual power needed to heat water. We give herewith some information that will be useful in estimating the power required.

HORSE-POWER REQUIRED

One boiler horse-power is equal to the work of evaporating 34½ pounds of water from 212 degrees—to steam at 212 degrees. As it takes 966 British thermal units to evaporate one pound of water from 212 degrees to steam, it follows the evaporation of 34½ pounds is equal to 33,327 B. T. U.

One gallon of water weighs (at 42 degrees) 8.33 pounds, therefore it takes 833 B. T. U. to heat one gallon 100 degrees; or, it will take 83,300 B. T. U. to heat 100 gallons and 833,000 to heat 1000 gallons from 42 degrees to 142 degrees Fahrenheit, or from any other temperature at which the water may be to a point 100 degrees higher.

As 33,327 B. T. U. is equal to one horse-power, and the work of heating 1000 gallons equals 833,000 B. T. U , we see by dividing the one into the other that heating 1000 gallons per hour is equal to practically twenty-five horse-power.

FUEL NEEDED TO HEAT WATER

The amount of heat in anthracite coal varies from 12,000 to 14,000 B. T. U. per pound, but the average will be about 12,500 B. T. U., which is the amount we assume in these calculations.

When burning coal in United States Water Heaters, about 70 per cent of the heat generated can be transmitted to the water, which is being circulated through the heater.

As shown in a previous paragraph it requires 833,000 B. T. U. to raise the temperature of 1000 gallons of water 100 degrees Fahrenheit.

If we transmit 70 per cent of the value of the fuel to the water (and as 70 per cent of 12,500 equals 8750 B. T. U.) for every 1000 gallons heated 100 degrees Fahrenheit, we must burn 95 pounds of coal.

PROPORTIONING RADIATION

FOR STEAM AND WATER HEATING

BECAUSE of different conditions surrounding the installation of a heating apparatus, it is impossible to give any set rule that can be accepted, without modification, for all kinds of buildings to be heated. It is necessary to take into consideration all of the conditions in and around any building, and additions or deductions made to suit the requirements, no matter what rule may be used for figuring.

Nearly all rules are based on two to five pounds steam pressure, and a temperature of 180 degrees for water, as indicated at the boiler when the outside temperature is at zero. When systems are designed for heating with a lower heat temperature at the boiler (vapor, vacuum, etc.), it is necessary to provide additional radiation in accordance with best practice for different systems.

It is general practice to consider 70 degrees as the standard for inside temperature and zero for the outside. When there is a greater difference between the inside and outside temperature, one per cent should be added to the radiation for each degree of difference.

Many contractors make the error of installing a too small amount of radiation. A little extra surface will give greater economy and insure a first-class working system, as well as a pleased owner. An apparatus of ample size can be regulated to give economy, which cannot be done if the apparatus is too small and requires forcing.

If direct-indirect radiation is to be used, 25 per cent should be added to the radiation necessary for direct heating. If indirect radiation is to be used, 50 per cent should be added to the amount of radiation necessary for direct heating. In schools, churches, etc., where ventilation is required, it is necessary to use some special rule for ventilating to obtain indirect surface. (Before determining the size of boiler required, 50 per cent should be added to indirect radiation to make it equivalent to direct.)

The following rules have been in general use for some time, but are not guaranteed. By using these rules and providing for additional radiation on the cold sides of building and making allowance for poor construction, loose fitting windows, doors, etc., good results will be obtained.

PROPORTIONING RADIATION—*Continued*

FOR STEAM AND WATER HEATING

RULE No. 1

THIS IS TERMED "RULE OF THUMB"

AS this method of figuring only considers the cubical contents of space to be heated, some experience in heating is required to determine the proper factor to be used for different conditions. The exposed wall and glass surface varies the amount of radiation to be used.

ONE SQUARE FOOT OF DIRECT RADIATION WILL HEAT

Dwellings	Cubic Feet by Hot Water	Cubic Feet by Steam
Living rooms, one side exposed	25 to 30	45 to 50
Living rooms, two sides exposed	20 to 30	40 to 50
Living rooms, three sides exposed	20 to 25	35 to 45
Sleeping rooms	30 to 40	50 to 60
Halls and bath rooms	20 to 30	40 to 50
Public Buildings		
Offices	30 to 50	50 to 75
School rooms	20 to 30	55 to 80
Factories and stores	40 to 60	80 to 100
Assembly halls and churches	60 to 80	100 to 125

RULE No. 2

KNOWN AS "MILLS' RULE"

One square foot of radiating surface for each 2 square feet of glass, and for each 20 square feet of exposed outside wall and each 200 cubic feet of space.

Example—A given room has 60 square feet of glass, 220 square feet of exposed wall and 2000 cubic feet of air. (Room is on first floor.)

Glass $60 \div 2 = 30$ square feet of radiation.
Wall $220 \div 20 = 11$ square feet of radiation.
Cubical contents $2000 \div 200 = 10$ square feet of radiation.

Total . . . 51 square feet of radiation.

Above figures are for steam. For water (in accordance with accepted standards) add 65 per cent. This would add for the above 33 square feet and make a total of 84 square feet.

PROPORTIONING RADIATION—*Continued*

FOR STEAM AND WATER HEATING

RULE No. 3

PROFESSOR R. C. Carpenter, of Cornell University, submits the following rule for determining the size radiator needed for a given room:

Rule—Add the area of the glass surface in the room to one-quarter of the exposed wall surface, and to this add from $\frac{1}{5}\frac{1}{5}$ to $\frac{3}{5}\frac{3}{5}$ of the cubical contents ($\frac{1}{5}\frac{1}{5}$ for rooms on upper floor, $\frac{2}{5}\frac{2}{5}$ for rooms on first floor and $\frac{3}{5}\frac{3}{5}$ for large halls); then for steam multiply by .25 and for hot water by .40.

Example—A room 20 x 12 x 10 feet with glass exposure of 48 feet, one-quarter of wall exposure (two sides exposed) 320 feet = 80, $\frac{1}{5}\frac{1}{5}$ of 2400 = 44.

$48 + 80 + 44 = 172 \times .25 = 43$ feet for steam.

If you add $\frac{2}{5}\frac{2}{5}$ the surface would be 54 feet.

If you add $\frac{3}{5}\frac{3}{5}$ the surface would be 65 feet.

SETTING INDIRECT RADIATORS

Indirect Radiators are used for ventilating and for foot warmers, and for those places where radiators in the rooms would be objectionable.

The illustration on opposite page shows the general method of hanging Indirect Radiators and setting of register with connecting duct.

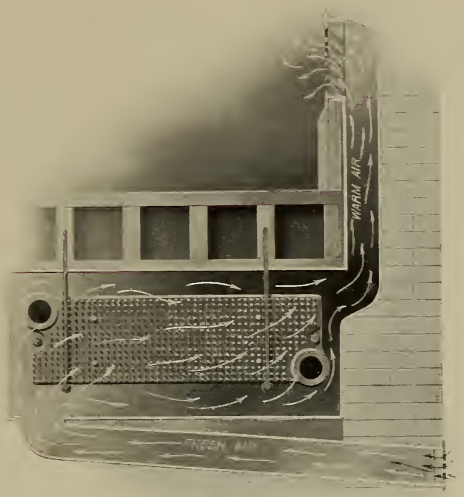
In setting indirect stacks, care should taken to see that both sides and ends come in contact with casings to prevent the passage of air other than directly through the radiator. A space of at least ten inches should be provided above the top and six to eight inches below the bottom of radiator for free circulation of air. The fresh air should be delivered to under side of radiator at opposite end from which the warm air is taken.

By using Capitol Casings for Indirect Radiators, as shown on page 165, much time and labor will be saved.

Better results are obtained by placing the register on the inside wall or near to an inside wall, when desired in floor. The warm air should be delivered to register from the top at one end of radiator.

Because the cold air comes in contact with Indirect Radiators, their cooling power is greatly increased over direct radiation and additional boiler capacity must be provided.

U. S. INDIRECT RADIATOR DATA



The following table will be found of much value when designing or installing Indirect Radiators.

SIZES OF AIR DUCTS AND REGISTERS FOR INDIRECT HEATING

Square Feet of Radiation	Cold Air Duct to Stack		Warm Air Duct		Registers		Tappings Inches
	For First Floors Square Inches	For Upper Floors Square Inches	For First Floors Square Inches	For Upper Floors Square Inches	For First Floors Inches	For Upper Floors Inches	
40	40	35	60	40	10x12	8x10	1 x ¾
50	50	40	75	50	10x12	8x10	1 x ¾
60	60	45	90	60	10x14	8x12	1¼x1
70	70	50	105	70	12x15	10x12	1¼x1
80	80	60	120	80	12x15	10x12	1¼x1
90	90	70	135	90	12x19	10x14	1½x1¼
100	100	75	150	100	12x19	12x15	1½x1¼
120	110	90	170	110	16x16	12x15	1½x1¼
140	120	105	190	120	16x18	12x18	2 x1½
160	130	120	210	130	16x20	12x20	2 x1½

AIR REQUIRED FOR VENTILATION

AN adult must have each hour for respiration and transpiration 215 feet or 215 x .077=16.55 pounds, and generates 290 B. T. U., of which 99 units are in form of vapor and 191 units radiate to surrounding objects.

Good practice requires not less than 1800 cubic feet of air per hour to cover all requirements for each person.

Each cubic foot gas burned requires 8.5 cubic feet air.

Each pound oil burned requires 150 cubic feet air.

Each pound candles burned requires 160 cubic feet air.

B. T. U. generated by an adult per hour, 191.

B. T. U. generated by burning 1 cubic foot gas, 600.

B. T. U. generated by burning 1 pound oil or candles, 15,000 to 18,000.

Average gas burner consumes approximately 4 cubic feet gas per hour, which equals 2,400 B. T. U. per hour.

Each flame from oil lamp, 430 to 515 B. T. U. per hour.

Each candle, 445 to 454 B. T. U. per hour.

B. T. U.—British Thermal Units.

SPECIFICATIONS OF MASSACHUSETTS FOR HEATING AND VENTILATING PUBLIC BUILDINGS, SCHOOLS, ETC.

1. That the apparatus will, with proper management, heat all the rooms including corridors to 70 degrees in any weather.

2. That with the rooms 70 degrees and a difference of not less than 40 degrees between the temperature of the outside air and that of the air entering the room at the warm air inlet, the apparatus will supply at least 30 cubic feet of air per minute for each scholar accommodated in the room.

3. That such supply of air will so circulate in the rooms that no uncomfortable draft will be felt, and that the difference in temperature between any two points on the breathing plane (5 feet) in the occupied portion of a room will not exceed 3 degrees.

4. That vitiated air in amount equal to supply from inlets will be removed through the vent ducts.

Tests are made by anemometer at both inlet and outlet registers to see that the requirements are fulfilled.

CUBICAL CONTENTS OF ROOMS

THE following tables give the cubical contents of various sizes of rooms, and will be convenient in figuring up heating contracts.

All rooms measuring more than the even foot should be calculated as six inches, but if more than six inches, the amount should be taken as an even foot next above. To illustrate: A room 6 feet 3 inches by 10 feet 8 inches should be taken as 6 by 11 feet, and so on.

Floor Area Feet	Ceiling Heights							
	8 feet	8½ feet	9 feet	9½ feet	10 feet	10½ feet	11 feet	12 feet
6 x 6	288	306	324	342	360	378	396	132
6 x 6½	322	332	351	370	390	410	429	468
6 x 7	336	357	378	399	420	441	462	504
6 x 7½	360	383	405	427	450	473	495	540
6 x 8	384	408	432	456	480	504	228	576
6 x 8½	408	434	459	484	510	536	561	612
6 x 9	432	459	486	513	540	567	594	648
6 x 9½	456	485	513	541	570	599	627	684
6 x10	480	510	540	570	600	630	660	728
6 x10½	504	536	567	598	630	662	693	756
6 x11	528	561	594	627	660	693	726	792
6 x11½	552	587	621	655	690	725	759	828
6 x12	576	612	648	684	720	756	792	864
6½x 6½	338	359	380	401	423	444	464	507
6½x 7	364	387	410	432	455	478	500	546
6½x 7½	390	414	439	463	488	512	536	585
6½x 8	416	442	468	494	520	546	572	624
6½x 8½	442	470	497	524	553	580	607	663
6½x 9	468	497	527	555	585	615	643	702
6½x 9½	494	525	557	586	618	648	679	741
6½x10	520	553	585	617	650	683	719	780
6½x10½	546	580	614	648	683	717	750	819
6½x11	572	608	644	679	715	751	786	858
6½x11½	598	635	673	710	748	785	822	897
6½x12	624	663	702	741	780	819	858	936
6½x12½	650	691	731	771	813	853	893	975
6½x13	676	718	761	802	845	887	929	1014
7 x 7	392	417	441	465	490	515	539	588
7 x 7½	420	446	473	498	525	551	577	630
7 x 8	448	476	504	532	560	588	616	672
7 x 8½	476	506	536	565	595	625	654	715
7 x 9	504	536	567	598	630	662	693	756
7 x 9½	532	565	599	631	665	698	731	798
7 x10	560	595	630	665	700	735	770	840
7 x10½	588	625	662	698	735	772	808	882
7 x11	616	655	993	731	770	809	847	924
7 x11½	644	684	725	764	805	845	885	966
7 x12	672	714	756	798	840	882	924	1008
7 x12½	700	744	788	831	875	919	962	1050
7 x13	728	774	819	864	910	956	1001	1092

CUBICAL CONTENTS OF ROOMS—*Continued*

Floor Area Feet	Ceiling Heights							
	8 feet	8½ feet	9 feet	9½ feet	10 feet	10½ feet	11 feet	12 feet
7 x13½	756	803	851	897	945	992	1039	1134
7 x14	784	833	882	931	980	1029	1078	1176
7 x 7½	450	478	506	534	563	591	618	675
7 x 8	480	510	540	570	600	630	660	720
7 x 8½	510	542	574	605	638	669	701	765
7 x 9	540	574	608	641	675	709	742	810
7 x 9½	370	606	641	676	713	748	783	855
7 x10	600	638	675	712	750	788	825	900
7 x10½	630	669	709	748	788	827	866	945
7 x11	660	701	743	783	825	866	907	990
7 x11½	690	733	776	819	863	906	948	1035
7½x12	720	765	810	85	900	945	990	1080
7½x12½	750	797	844	890	938	984	1031	1125
7½x13	780	829	878	926	975	1024	1072	1170
7½x13½	810	861	911	961	1013	1063	1113	1215
7½x14	840	893	945	997	1050	1103	1155	1260
7½x14½	870	924	979	1033	1088	1142	1196	1305
7½x15	900	956	1013	1068	1125	1181	1237	1350
8 x 8	512	544	576	608	640	672	704	768
8 x 8½	544	578	612	646	680	714	748	816
8 x 9	576	612	648	684	720	756	792	864
8 x 9½	608	646	684	722	760	798	836	912
8 x10	640	680	720	760	800	840	880	960
8 x10½	672	714	756	798	840	882	924	1008
8 x11	704	748	792	836	880	924	968	1056
8 x11½	736	782	828	874	920	966	1014	1104
8 x12	768	816	864	912	960	1008	1056	1152
8 x12½	800	859	900	950	1000	1050	1100	1200
8 x13	832	884	936	988	1040	1992	1144	1248
8 x13½	864	918	972	1026	1080	1134	1188	1296
8 x14	896	952	1008	1064	1120	1176	1232	1344
8 x14½	928	986	1044	1102	1160	1218	1276	1392
8 x15	960	1020	1080	1140	1200	1260	1320	1440
8 x15½	992	1054	1116	1178	1240	1302	1364	1488
8 x16	1024	1038	1152	1216	1280	1344	1408	1536
8½x 8½	578	614	650	686	723	759	794	867
8½x 9	612	650	689	726	765	803	841	918
8½x 9½	646	686	727	767	808	848	888	969
8½x10	680	723	765	807	850	893	935	1020
8½x10½	714	759	803	847	893	937	981	1071
8½x11	748	795	842	888	935	982	1028	1122
8½x11½	782	831	880	928	978	1026	1075	1173
8½x12	616	867	918	969	1020	1071	1122	1224
8½x12½	850	903	956	1009	1063	1116	1168	1275
8½x13	884	939	995	1049	1105	1160	1215	1326
8½x13½	918	975	1033	1090	1148	1205	1262	1377
8½x14	952	1012	1071	1130	1190	1250	1309	1428
8½x14½	986	1048	1109	1170	1233	1294	1355	1479
8½x15	1020	1184	1148	1121	1275	1339	1402	1530
8½x15½	1054	1120	1186	1251	1318	1383	1449	1581

CUBICAL CONTENTS OF ROOMS—*Continued*

Floor Area Feet	Ceiling Heights							
	8 feet	8½ feet	9 feet	9½ feet	10 feet	10½ feet	11 feet	12 feet
8½x16	1088	1156	1224	1292	1360	1428	1496	1632
8½x16½	1122	1192	1262	1332	1403	1473	1542	1683
8½x17	1156	1228	1301	1372	1445	1517	1589	1734
9 x 9	648	689	729	769	810	851	891	972
9 x 9½	684	727	770	812	855	898	940	1026
9 x10	720	765	810	855	900	945	990	1080
9 x10½	756	803	851	897	945	992	1039	1134
9 x11	792	842	891	940	890	1040	1089	1188
9 x11½	828	880	932	982	1035	1087	1138	1242
9 x12	864	918	972	1026	1080	1134	1188	1296
9 x12½	900	956	1013	1068	1125	1181	1237	1350
9 x13	936	995	1053	1111	1170	1229	1287	1404
9 x13½	972	1033	1094	1154	1215	1276	1336	1458
9 x14	1008	1071	1134	1197	1260	1323	1386	1512
9 x14½	1044	1109	1175	1239	1305	1370	1435	1566
9 x15	1080	1148	1215	1282	1350	1418	1485	1620
9 x15½	1116	1186	1256	1325	1395	1465	1534	1674
9 x16	1152	1224	1296	1368	1440	1512	1584	1728
9 x16½	1188	1262	1337	1410	1485	1559	1633	1782
9 x17	1224	1301	1377	1453	1530	1607	1683	1836
9 x17½	1260	1339	1418	1496	1575	1654	1732	1890
9½x18	1296	1377	1458	1539	1620	1701	1782	1944
9½x 9½	722	767	812	857	903	948	992	1083
9½x10	760	808	855	902	950	998	1045	1140
9½x10½	798	848	898	947	998	1047	1097	1197
9½x11	836	888	940	992	1045	1097	1149	1254
9½x11½	874	929	983	1038	1093	1147	1201	1311
9½x12	912	969	1026	1083	1140	1197	1254	1368
9½x12½	950	1009	1069	1128	1188	1247	1306	1425
9½x13	988	1050	1111	1173	1235	1297	1358	1482
9½x13½	1026	1090	1154	1218	1283	1347	1410	1539
9½x14	1064	1131	1197	1263	1330	1397	1463	1596
9½x14½	1102	1171	1240	1308	1378	1446	1515	1653
9½x15	1140	1211	1282	1353	1425	1496	1567	1710
9½x15½	1178	1252	1325	1398	1473	1546	1619	1767
9½x16	1216	1292	1368	1444	1520	1596	1672	1824
9½x16½	1254	1332	1411	1489	1568	1646	1724	1881
9½x17	1292	1373	1453	1534	1615	1696	1776	1938
9½x17½	1330	1413	1496	1579	1663	1746	1828	1995
9½x18	1368	1454	1539	1624	1710	1796	1881	2052
9½x18½	1406	1494	1582	1669	1758	1845	1933	2109
9½x19	1444	1534	1625	1714	1805	1895	1985	2166
10 x10	800	850	900	950	1000	1050	1100	1200
10 x10½	840	893	945	996	1050	1103	1155	1260
10 x11	880	935	990	1045	1100	1155	1210	1320
10 x11½	920	978	1035	1092	1150	1208	1265	1380
10 x12	960	1020	1080	1140	1200	1260	1320	1440
10 x12½	1000	1063	1125	1187	1250	1313	1375	1500
10 x13	1040	1105	1170	1235	1300	1365	1430	1560
10 x13½	1080	1148	1215	1282	1380	1418	1485	1820

CUBICAL CONTENTS OF ROOMS—*Continued*

Floor Area Feet	Ceiling Heights							
	8 feet	8½ feet	9 feet	9½ feet	10 feet	10½ feet	11 feet	12 feet
10x14	1120	1190	1260	1330	1400	1470	1540	1680
10x14½	1160	1233	1305	1377	1450	1523	1595	1740
10x15	1200	1275	1350	1425	1500	1575	1650	1800
10x15½	1240	1318	1395	1472	1550	1628	1705	1860
10x16	1280	1360	1440	1520	1600	1680	1760	1920
10x16½	1320	1402	1485	1567	1650	1733	1815	1980
10x17	1316	1445	1530	1615	1700	1785	1870	2040
10x17½	1400	1488	1577	1662	1750	1838	1925	2100
10x18	1440	1530	1620	1710	1800	1890	1930	2160
10x18½	1480	1573	1665	1757	1850	1943	2035	2220
10x19	1520	1615	1710	1805	1900	1995	2090	2280
10x19½	1560	1658	1755	1852	1950	2048	2155	2340
10x20	1600	1700	1800	1900	2000	2100	2200	2400
11x11	968	1029	1089	1249	1210	1271	1331	1452
11x12	1056	1122	1188	1254	1320	1386	1452	1584
11x13	1114	1216	1287	1358	1430	1502	1573	1716
11x14	1232	1309	1386	1463	1540	1617	1694	1848
11x15	1320	1403	1485	1567	1650	1733	1815	1980
11x16	1408	1496	1584	1672	1760	1848	1936	2112
11x17	1496	1590	1683	1776	1870	1964	2057	2244
11x18	1584	1683	1782	1881	1980	2079	2178	2376
11x19	1672	1777	1881	1986	2090	2195	2299	2508
11x20	1760	1870	1980	2090	2200	2310	2420	2640
11x21	1848	1964	2075	2194	2310	2426	2541	2772
11x22	1936	2057	2178	2299	2420	2541	2662	2904
12x12	1152	1224	1296	1368	1440	1512	1584	1728
12x13	1248	1326	1404	1482	1560	1638	1716	1872
12x14	1344	1428	1512	1596	1680	1764	1848	1016
12x15	1440	1530	1620	1710	1800	1890	1980	2160
12x16	1536	1632	1728	1824	1920	2016	2112	2304
12x17	1632	1734	1836	1838	2040	2142	2244	2448
12x18	1728	1836	1944	2051	2160	2268	2376	2592
12x19	1824	1938	2052	2166	2280	2394	2508	2736
12x20	1920	2040	2160	2280	2400	2520	2640	2880
12x21	2016	2142	2268	2394	2520	2646	2772	3024
12x22	2112	2244	2376	2508	2640	2772	2904	3168
12x23	2208	2346	2484	2622	2760	2898	3036	3312
12x24	2304	2448	2592	2736	2880	3024	3168	3456
13x13	1352	1437	1522	1605	1690	1775	1859	2028
13x14	1456	1547	1638	1729	1820	1911	2002	2184
13x15	1560	1658	1755	1852	1950	2048	2145	2340
13x16	1664	1768	1872	1976	2080	2184	2288	2496
13x17	1768	1879	1989	2099	2210	2321	2431	2652
13x18	1872	1989	2106	2223	2340	2457	2574	2808
13x19	1976	2100	2223	2364	2470	2594	2717	2964
13x20	2080	2210	2340	2470	2600	2730	2860	3120
13x21	2184	2321	2457	2593	2730	2867	3003	3279
13x22	2288	2431	2574	2717	2860	3003	3146	3442
13x23	2392	2542	2691	2840	2990	3140	3289	3588
13x24	2496	2652	2808	2964	3120	3276	3432	3774

CUBICAL CONTENTS OF ROOMS—*Continued*

Floor Area Feet	Ceiling Heights							
	8 feet	8½ feet	9 feet	9½ feet	10 feet	10½ feet	11 feet	12 feet
13x25	2600	2763	2925	3087	3250	3413	3577	3900
13x26	2704	2873	3042	3211	3380	3549	3718	4056
14x14	1568	1666	1764	1862	1960	2058	2156	2352
14x15	1680	1785	1890	1995	2100	2205	2310	2520
14x16	1792	1904	2016	2128	2240	2352	2464	2688
14x17	1904	2023	2142	2261	2380	2499	2618	2856
14x18	2016	2142	2268	2394	2520	2646	2772	3024
14x19	2128	2261	2394	2527	2660	2793	2926	3192
14x20	2240	2380	2520	2660	2800	2940	3080	3360
14x21	2352	2499	2646	2793	2940	3087	3234	3528
14x22	2464	2618	2772	2926	3080	3234	3388	3696
14x23	2576	2737	2898	3059	3220	3381	3542	3864
14x24	2688	2856	3024	3192	3360	3528	3696	4032
14x25	2800	2775	3150	3325	3500	3675	3850	4200
14x26	2912	3094	3276	3458	3640	3822	4004	4368
14x27	3024	3213	3402	3591	3780	3969	4158	4536
14x28	3136	3332	3528	3724	3920	4116	4312	4704
15x15	1800	1913	2025	2137	2250	2363	2475	2000
15x16	1920	2040	2160	2280	2400	2520	2640	2880
15x17	2040	2168	2295	2422	2550	2678	2805	3060
15x18	2160	2295	2530	2565	2700	2835	2970	3240
15x19	2280	2423	2565	2707	2850	2993	3135	3420
15x20	2400	2550	2700	2850	3000	3150	3300	3600
15x21	2520	2678	2835	2992	3150	3308	3465	3780
15x22	2648	2805	2970	3135	3300	3465	3630	3960
15x23	2700	2933	3105	3277	3450	3623	3795	4140
15x24	2880	3060	3240	4420	3600	3780	3960	4320
15x25	3000	3188	3375	3562	3750	3938	4125	4500
15x26	3120	3315	3510	3705	3900	4095	4290	4680
15x27	3240	3443	3645	3847	4050	4253	4455	4860
15x28	3360	3570	3780	3990	4200	4410	4620	5040
15x29	3480	3698	3915	4132	4350	4568	4785	5220
15x30	3600	3825	4050	4275	4500	4825	4950	5400
16x16	2048	2176	2304	2432	2560	2688	2816	3072
16x17	2176	2312	2448	2584	2720	2856	2992	3264
16x18	2304	2448	2592	2736	2880	3024	3168	3456
16x19	2431	2584	2736	2888	3040	3192	3344	3648
16x20	2560	2720	2880	3040	3200	3360	3520	3840
16x21	2688	2856	3024	3192	3360	3528	3696	4032
16x22	2816	2992	3168	3344	3520	3696	3872	4224
16x23	2944	3128	3312	3496	3680	3864	4048	4416
16x24	3072	3264	3456	3648	3840	4032	4224	4608
16x25	3200	3400	3600	3800	4000	4200	4400	4800
16x26	3328	3536	3744	3952	4160	4368	4576	4992
16x27	3456	3672	3888	4104	4320	4536	4752	5184
16x28	3584	3808	4032	4256	4480	4704	4928	5376
16x29	3712	3944	4176	4408	4640	4872	5104	5568
16x30	3840	4080	4320	4560	4800	5040	5280	5760
16x31	3968	4216	4464	4712	4960	5208	5456	5952
16x32	4096	4353	4806	4864	5120	5376	5632	6144

GREENHOUSE HEATING

IN greenhouse heating hot water has been found the most satisfactory for small plants. Steam, however, has many advantages for large plants, or where the heat must be carried long distances.

In proportioning the necessary amount of radiation, the exposed glass and wall surface are the only direct factors to be considered, but the construction of house, the relative exposed location and lowest outside temperature should be carefully noted.

One square foot of glass is equal to each four square feet of wall, when of frame construction, or each six square feet of wall when concrete.

The method of figuring, as given in the following example, will be found useful.

EXAMPLE—An even span house 100 feet long, 20 feet wide, sash bars 11½ feet, side wall 5 feet high, of which 2 feet is glass, with one end exposed all glass, is to be heated to 60 degrees when the outside temperature is at zero.

Glass in sash bars, $11\frac{1}{2} \times 100 \times$ (2 sides) . . .	=	100 sq. ft.
Glass on sides, $2 \times 100 \times$ (2 sides)	=	400 sq. ft.
Glass in end of house, including gable		160 sq. ft.
Glass equivalent of wall, $3 \times 100 \times$ (2 sides) $\div 6$.	=	100 sq. ft.
Total glass		2960 sq. ft.

By referring to the table opposite, it will be found that this amount of glass surface for a temperature of 60 degrees requires 490 square feet of heating surface for steam, or 840 square feet for water. The coils can be determined from table given on page 205.

For the above illustration a 3-inch supply pipe, carried through house, is ample for steam, and one 4-inch or two 3-inch supply pipes will give good results for a gravity water system. When these supply pipes are carried through the house, the heating surface contained in them can be figured as a part of total amount required and the remainder placed in the coils.

The heat will be more evenly distributed if a small coil is placed under each bench, rather than in a less number of larger coils.

The supply mains should be carried overhead in the house, on a downward grade from boiler to far end, and there supply the coils, unless the house is more than 150 feet long, when they can best be carried to center of house and connected to coils, which, in this latter arrangement, should be separated at the center and graded downward to both ends of house, making the high points of coils in the center.

The coils should have an even grade of one inch in every fifteen feet, without traps or pockets. The air should be relieved at the low points for steam and at the high points for water. Each coil should be individually vented for steam or water, and at the high point of each main for water.

Because of greater efficiency of pipe coils and exposed mains, the size of boiler should be of a greater capacity than for other work.

As chimneys for greenhouses are often low in height, a larger flue should be provided than is required when of greater height.

GREENHOUSE HEATING

Table of Amounts of Steam and Water Radiating Surface Necessary to Heat a Given Amount of Glass Exposure to Various Temperatures in Zero Weather

Square Feet of Glass Exposure	STEAM — Number of Square Feet of Radiation Required at				
	40°	45°	50°	60°	70°
25	2 7-9	3 1-8	3 4-7	4 1-6	5
50	5 5-9	6 1-4	7 1-7	8 1-3	10
75	8	9	10	13	15
100	11	13	14	17	20
200	23	25	30	33	40
300	34	38	43	50	60
400	45	50	57	67	80
500	56	63	72	83	100
1,000	112	125	143	167	200
2,000	223	250	286	333	400
3,000	334	375	429	500	600
4,000	445	500	571	667	800
5,000	556	625	714	833	1000
10,000	1112	1250	1429	1667	2000
20,000	2223	2500	2857	3333	4000

Square Feet of Exposure	HOT WATER — Number of Square Feet of Radiation Required at				
	40°	45°	50°	60°	70°
25	4 1-6	5	6 1-4	7 1-7	8 1-3
50	8	10	13	14	16
75	13	15	19	21	25
100	17	20	25	29	33
200	33	40	50	57	67
300	50	60	75	86	100
400	67	80	100	114	133
500	83	100	125	143	167
1,000	167	200	250	286	333
2,000	333	400	500	572	667
3,000	500	600	750	857	1000
4,000	667	800	1000	1143	1333
5,000	833	1000	1250	1429	1667
10,000	1667	2000	2500	2857	3333
20,000	3333	4000	5000	5714	6667

The above is for well built houses with closely fitted sash. If poorly built or with loose sash, add 1½ to 12½ per cent to the above

TABLE FOR PROPORTIONING SINGLE PIPE STEAM MAINS

Square Feet Radiation	Total Length of Main in Feet						
	20	40	75	100	150	200	Return
	Diameter, Inches	Diameter, Inches	Diameter, Inches	Diameter, Inches	Diameter, Inches	Diameter, Inches	Diameter, Inches
100	1¼	1¼	1½	1½	1½	2	1
200	1½	1½	2	2	2	2	1¼
300	2	2	2	2	2	2½	1¼
400	2	2	2½	2½	2½	2½	1¼
500	2½	2½	2½	3	3	3	1¼
600	2½	3	3	3	3	3½	1½
700	2½	3	3	3	3½	3½	1½
800	3	3	3	3	3½	3½	1½
1000	3	3½	3½	3½	3½	4	2
1200	3½	4	4	4	4	4	2
1400	3½	4	4	4	4	5	2
1600	4	4	4	5	5	5	2½
1800	4	5	5	5	5	5	3
2000	4	5	5	5	5	5	3
2500	5	5	5	5	6	6	3
3000	5	5	6	6	6	6	3
3500	5	6	6	6	6	7	3
4000	6	6	6	7	7	7	3½
5000	7	7	7	8	8	8	4
6500	8	8	8	9	9	9	5

Add 50 per cent to pipe capacity for indirect radiation.

PRICE LIST OF FITTINGS, VALVES, ETC.

Size, Inches	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	6
Elbows, cast iron, R. H., each	..	$0.05	$0.05	$0.06	$0.08	$0.10½	$0.16	$0.20	$0.28	$0.50	$0.75	$1.05	$1.20	$1.75	$2.00	$2.75
Elbows, cast iron, R. and L., each	..	.06	.06	.07	.09	.12	.18	.23	.32	.60	.85					
Elbows, cast iron, reducing, each	..	..	..	.07	.09	.12	.18	.23	.32	.60	.85	1.20	1.40	2.00	2.30	3.15
Elbows, cast iron, 45 degrees, each	..	..	.06	.07	.10	.12	.19	.24	.34	.60	.90	1.25	1.45	2.20	2.50	3.45
Elbows, cast iron, No. 1, water, each	..	..	..	..	..	.32	.40	.55	.80	1.20	2.25	3.25	3.50	5.50	6.50	8.75
Elbows, double branch, No. 2, water, each	..	..	..	..	..	.64	.80	1.10	1.60	2.40	4.50	6.50	7.00	11.00	13.00	17.50
Tees, cast iron, each	..	.08	.08	.09	.12	.15	.23	.29	.41	.73	1.10	1.50	1.75	2.55	3.00	4.00
Tees, cast iron reducing, each	..	..	..	.10	.14	.17	.27	.33	.47	.83	1.25	1.75	2.00	2.95	3.50	4.60
Tees, cast iron, No. 3, water, each	..	..	..	..	..	.48	.60	.82	1.20	1.80	3.40	4.90	5.25	8.25	9.75	13.25
Crosses, cast iron, each	..	..	..	.16	.22	.27	.42	.53	.75	1.30	2.00	2.70	3.15	4.60	5.50	7.25
Crosses, cast iron, reducing, each	..	..	..	.18	.25	.30	.46	.60	.83	1.45	2.20	3.00	3.50	5.10	6.00	8.00
Plugs, cast iron, each	$0.02	.02	.02	.02	.03	.04	.05	.07	.10	.18	.25	.38	.42	.65	.88	1.20
Bushings, each	..	.04	.04	.04	.05	.06	.07	.09	.14	.21	.30	.40	.50	.75	.93	1.25
Caps, malleable, each	..	.03	.04	.05	.08	.12	.16	.24	.32	.45	.85	1.00	1.20			
Lock nuts, each	..	.02	.03	.04	.05	.07	.09	.11	.18	.27	.34	.47	.64	.85	.90	1.30
Reducers, each	..	.03	.03	.05	.10	.16	.20	.28	.45	.70	1.00	1.50	1.85	1.85	2.00	2.70
Unions, each	.18	.18	.20	.22	.27	.33	.46	.58	.75	1.55	2.10	3.65	4.35			
Flange unions, cast iron, each	..	..	..	.40	.46	.52	.64	.78	1.00	1.25	1.50	1.80	2.10	2.70	3.15	3.95
Return bends, cast iron, C. P., each	..	..	..	.18	.20	.22	.28	.40	.57	1.20	1.70					
Return bends, cast iron, O. P., each	..	..	..	..	.26	.30	.40	.55	.80	1.35	2.20					
Nipples, short, each	.04	.04	.04	.05	.06	.08	.11	.13	.18	.39	.48	.75	.85	1.25	1.55	1.85
Nipples, long, each	.06	.06	.06	.07	.09	.13	.17	.20	.27	.59	.72	1.05	1.20	1.70	2.45	2.90
Couplings, wrought iron, each	.05	.05	.06	.07	.10	.13	.17	.21	.28	.40	.60	.80	1.00	1.50	1.65	2.40
Globe and angle valves, iron, flanged, each	..	..	..	..	..	..	..	..	7.00	9.00	12.50					
Globe and angle valves, iron yoke, screwed, each	..	..	..	..	..	..	..	..	7.00	9.00	12.50	15.25	19.00	24.00	27.00	37.50
Globe and angle valves, iron yoke, flanged, each	..	..	..	..	..	..	..	..	8.60	10.75	15.00	18.50	22.50	27.50	31.00	42.00
Check valves, iron, screwed, each	..	..	..	..	..	..	..	..	3.60	6.50	8.90	12.25	14.25	19.00	22.00	30.00
Check valves, iron, flanged, each	..	..	..	..	..	..	..	..	5.25	8.25	11.50	15.50	18.00	22.50	26.00	35.00

STANDARD WROUGHT-IRON PIPE

PRICE LIST AND DIMENSIONS

Nominal Inside Diameter Inches	Price per Foot	Actual Inside Diameter Inches	Internal Area Inches	Thickness Inches	Nominal Weight per Foot Pounds	Length of Pipe per Square Foot Outside Surface Feet	Number of Gallons of Water per 100 Feet of Length
⅛	$0.05½	0.270	0.0583	.068	0.24	9.44	
¼	.05½	0.364	0.1041	.088	0.42	7.075	
⅜	.05½	0.494	0.1917	.091	0.56	5.657	
½	.08½	0.623	0.3048	.109	0.84	4.547	
¾	.11½	0.824	0.5333	.113	1.12	3.637	2.7
1	.16½	1.048	0.8627	.134	1.67	2.903	4.5
1¼	.22½	1.380	1.496	.140	2.24	2.301	7.7
1½	.27	1.511	2.038	.145	2.68	2.01	10.6
2	.36	2.067	3.356	.154	3.61	1.608	17.4
2½	.57½	2.468	4.784	.204	5.74	1.328	24.8
3	.75½	3.067	7.388	.217	7.54	1.091	38.4
3½	.95	3.548	9.887	.226	9.00	0.955	51.3
4	1.08	4.026	12.730	.237	10.66	0.849	66.1
4½	1.30	4.508	15.961	.246	12.49	0.764	82.8
5	1.45	5.045	19.990	.259	14.50	0.687	104.2
6	1.88	6.065	28.889	.280	18.76	0.577	151.0
7	2.35	7.023	38.738	.301	23.27	0.501	202.0
8	2.82	7.982	50.039	.322	28.18	0.443	261.0
9	3.40	8.937	62.733	.344	33.70	0.397	332.0
10	4.25	10.019	78.838	.366	40.00	0.355	410.0
11	4.75	11.000	95.033	.375	45.00	0.325	495.0
12	5.20	12.000	113.098	.375	49.00	0.299	590.0

TABLE OF EXPANSION OF WROUGHT-IRON PIPE

Temperature of the Air when the Pipe is Fitted	Length of Pipe when Fitted	Length of Pipe when Heated to							
		215°		265°		297°		338°	
Degrees Fahrenheit	Feet	Ft.	In.	Ft.	In.	Ft.	In.	Ft.	In.
Zero	100	100	1.72	100	2.12	100	2.31	100	2.70
32	100	100	1.47	100	1.78	100	2.12	100	2.45
64	100	100	1.21	100	1.61	100	1.87	100	2.19

Care must be taken to allow for the free expansion of all mains and risers.

SQUARE FEET OF RADIATING SURFACE OF PIPE PER LINEAL FOOT

On all lengths over one foot, fractions less than tenths are added to or dropped.

Length of Pipe	Size of Pipe									
	¾	1	1¼	1½	2	2½	3	4	5	6
1 ¢	.275	.346	.434	.494	.622	.753	.916	1.175	1.455	1.739
2	.5	.7	.9	1.	1.2	1.5	1.8	2.4	2.9	3.5
3	.8	1.	1.3	1.5	1.9	2.3	2.7	3.5	4.4	5.2
4	1.1	1.4	1.7	2.	2.5	3.	3.6	4.7	5.8	7.
5	1.4	1.7	2.2	2.4	3.1	3.8	4.6	5.8	7.3	7.7
6	1.6	2.1	2.6	2.9	3.7	4.5	5.5	7.	8.7	10.5
7	1.9	2.4	3.	3.4	4.4	5.3	6.4	8.2	10.2	12.1
8	2.2	2.8	3.5	3.9	5.	6.	7.3	9.4	11.6	13.9
9	2.5	3.1	3.9	4.4	5.6	6.8	8.2	10.6	13.1	15.7
10	2.7	3.5	4.3	4.9	6.2	7.5	9.1	11.8	14.6	17.4
11	3.	3.8	4.8	5.4	6.8	8.3	10.	12.9	16.	19.1
12	3.3	4.1	5.2	5.9	7.5	9.	11.	14.1	17.4	20.9
13	3.6	4.5	5.6	6.4	8.1	9.8	11.9	15.3	18.9	22.6
14	3.8	4.8	6.1	6.9	8.7	10.5	12.8	16.5	20.3	24.3
15	4.1	5.2	6.5	7.4	9.3	11.3	13.7	17.6	21.8	26.1
16	4.4	5.5	6.9	7.9	10.	12.	14.6	18.8	23.2	27.8
17	4.7	5.9	7.4	8.4	10.6	12.3	15.5	20.	24.7	29.5
18	5.	6.2	7.8	8.9	11.2	13.5	16.5	21.2	26.2	31.3
19	5.2	6.6	8.3	9.4	11.8	14.3	17.4	22.3	27.6	33.1
20	5.5	6.9	8.7	9.9	12.5	15.	18.3	23.5	29.1	34.8
21	5.8	7.3	9.1	10.4	13.	15.8	19.2	24.7	30.5	36.5
22	6.	7.6	9.6	10.9	13.7	16.5	20.2	25.9	32.	38.3
23	6.3	8.	10.	11.3	14.3	17.3	21.1	27.	33.5	40.
24	6.6	8.3	10.4	11.9	14.9	18.	22.	28.2	34.9	41.7
25	6.9	8.6	10.9	12.3	15.6	18.8	22.9	29.3	36.4	43.5
26	7.1	9.	11.3	12.8	16.2	19.5	23.8	30.5	37.8	45.2
27	7.4	9.4	11.7	13.3	16.8	20.3	24.7	31.7	39.3	47.
28	7.7	9.7	12.2	13.8	17.4	21.	25.6	32.9	40.7	48.7
29	8.	10.	12.6	14.3	18.	21.8	26.6	34.1	42.2	50.4
30	8.3	10.4	13.	14.8	18.7	22.5	27.5	35.3	43.6	52.1
31	8.5	10.7	13.5	15.3	19.3	23.3	28.4	36.4	45.1	53.9
32	8.8	11.1	13.9	15.8	19.9	24.1	29.3	37.6	46.5	55.6
33	9.1	11.4	14.3	16.3	20.5	24.8	30.2	38.8	48.	57.4
34	9.4	11.7	14.7	16.8	21.2	25.6	31.1	40.	49.5	59.1
35	9.6	12.1	15.2	17.3	21.8	26.3	32.	41.1	50.9	60.8
36	9.9	12.5	15.6	17.8	22.4	27.	33.	42.3	52.4	62.6
37	10.2	12.8	16.1	18.3	23.	27.8	33.9	43.5	53.8	64.3
38	10.5	13.2	16.5	18.8	23.7	28.5	34.8	44.6	55.2	66.
39	10.7	13.5	16.9	19.3	24.3	29.3	35.7	45.8	56.7	67.8
40	11.	13.8	17.4	19.8	24.9	30.1	36.6	47.	58.2	69.5
41	11.3	14.2	17.8	20.3	25.5	30.8	37.6	48.2	59.6	71.3
42	11.5	14.5	18.2	20.8	26.1	31.6	38.5	49.4	61.1	73.
43	11.8	14.9	18.7	21.3	26.8	32.3	39.4	50.6	62.5	74.8
44	12.1	15.2	19.1	21.8	27.4	33.1	40.3	51.7	64.	76.5
45	12.4	15.6	19.5	22.2	28.	33.8	41.2	52.9	65.5	78.2
46	12.7	15.9	20.	22.7	28.6	34.6	42.2	54.	67.	80.
47	12.9	16.3	20.4	23.2	29.2	35.3	43.	55.2	68.4	81.7
48	13.2	16.6	20.8	23.7	29.9	36.1	43.9	56.4	69.8	83.5
49	13.5	17.	21.3	24.2	30.5	36.8	44.8	57.6	71.2	85.1
50	13.8	17.3	21.7	24.7	31.1	37.6	45.8	58.7	72.7	87.

NOTE—Above information is quoted from standard authorities. Not guaranteed.

BLOWING OFF A STEAM BOILER

A STEAM boiler should be blown off within one week after it is in operation, to remove the unavoidable accumulation of oil, grease, etc., that have a tendency to cause a boiler to foam, preventing the generation of steam and causing an unsteady water line. This can only be done when the boiler is under pressure. If one blowing off does not result in a steady water line and clean gauge, the operation must be repeated a second, or, if necessary, a third and fourth time.

1. Close all radiator valves, or, if the mains are valved, close both flow and return valves tightly, and also close the cock below the diaphragm regulator on boiler.

2. With a wood fire and boiler filled to center of water glass, get up a pressure of not less than 10 to 12 pounds by the steam gauge.

3. Open the blow-off cock, being careful that sufficient fire is carried to maintain a pressure until the last gallon of water is blown out.

4. Draw any remaining fire and open all fire and flue doors wide.

5. Allow the boiler to cool down, which will probably take from one-half to one hour, then close the blow-off cock and slowly fill boiler to water line.

6. Open all valves on flow and return lines, the diaphram cock, and also the radiator valves.

7. Rebuild fire.

8. Repeat the operation until there is a steady water line and a clean gauge glass.

PROPERTIES OF STEAM

Pressure in Pounds Per Square Inch		Temperature in Fahrenheit Degrees	Volume		Latent Heat in Fahrenheit Degrees	Total Heat from Water at 32 Degrees in Heat Units
By Atmosphere and by Steam Gauge	Above Atmosphere		Compared with Water	Cubic Feet of Steam from 1 Pound of Water		
—12	2	137.	10730	135.	1019.	1124.
—10	4	160.	5588	78.3	1003.	1131.
— 8	6	175.	3816	55.9	992.	1135.
— 6	8	187.	2912	43.6	984.	1139.
— 4	10	197.	2361	35.8	977.	1142.
— 2	12	205.	1990	30.6	971.	1144.
0	15	212.0	1642	26.36	965.2	1146.1
5	20	228.0	1229	19.72	952.8	1150.9
10	25	240.1	996	15.99	945.3	1154.6
15	30	250.4	838	13.46	937.9	1157.8
20	35	259.3	726	11.65	931.6	1160.5
25	40	267.3	640	10.27	926.0	1162.9
30	45	274.4	572	9.18	920.9	1165 1
35	50	281.0	518	8.31	916.3	1167.1
40	55	287.1	474	7.61	912.0	1169.0
45	60	292.7	437	7.01	908.0	1170.7
50	65	298.0	405	6.49	904.2	1172 3
55	70	302.9	378	6.07	900.8	1173.8
60	75	307.5	353	5.68	897.5	1175.2
65	80	312.0	333	5.35	894.3	1176.5
70	85	316.1	314	5.05	891.4	1177.9
75	90	320.2	298	4.79	888.5	1179.1
80	95	324.1	283	4.55	885.8	1180.3
85	100	327.9	270	4.33	883.1	1181.4
90	105	331.3	257	4.14	880.7	1182.4
95	110	334.6	247	3.97	878.3	1183.5
100	115	338.0	237	3.80	875.9	1184.5
110	125	344.2	219	3.51	871.5	1186.4
120	135	350.1	203	3.27	867.4	1188.2
130	145	355.6	190	3.06	863.5	1189.9
140	155	361.0	179	2.87	859.7	1191.5
150	165	366.0	169	2.71	856.2	1192.9
160	175	370.8	159	2.56	852.9	1194.4
170	185	375.3	151	2.43	849 6	1195.8
180	195	379.7	144	2.31	846.5	1197.2

TABLE OF POWER OF TRANSMITTING HEAT OF VARIOUS BUILDING SUBSTANCES COMPARED WITH GLASS

Window glass	1.000
Oak and walnut	.66
White pine	.80
Pitch pine	.100
Lath and plaster	.75 to .100
Common brick (rough)	.200 to .250
Common brick (whitewashed)	.200
Granite or slate	.250
Sheet iron	1.030 to 1.100

HEAT UNITS IN WATER

BETWEEN 32 AND 212 DEGREES FAHRENHEIT, AND WEIGHT OF WATER PER CUBIC FOOT

Temperature Degrees F.	Heat Units	Weight in Pounds per Cubic Foot	Temperature Degrees F.	Heat Units	Weight in Pounds per Cubic Foot	Temperature Degrees F.	Heat Units	Weight in Pounds per Cubic Foot
32	0.	62.42	123	91.16	61.68	168	136.44	60.81
35	3.	62.42	124	92.17	61.67	169	137.45	60.79
40	8.	62.42	125	93.17	61.65	170	138.45	60.77
45	13.	62.42	126	94.17	61.63	171	139.46	60.75
50	18.	62.41	127	95.18	61.61	172	140.47	60.73
52	20.	62.40	128	96.18	61.60	173	141.48	60.70
54	22.01	62.40	129	97.19	61.58	174	142.49	60.68
56	24.01	62.39	130	98.19	61.56	175	143.50	60.66
58	26.01	62.38	131	99.20	61.54	176	144.51	60.64
60	28.01	62.37	132	100.20	61.52	177	145.52	60.62
62	30.01	62.36	133	101.21	61.51	178	146.52	60.59
64	32.01	62.35	134	102.21	61.49	179	147.53	60.57
66	34.02	62.34	135	103.22	61.47	180	148.54	60.55
68	36.02	62.33	136	104.22	61.45	181	149.55	60.53
70	38.02	62.31	137	105.23	61.43	182	150.56	60.50
72	40.02	62.30	138	106.23	61.41	183	151.57	60.48
74	42.03	62.28	139	107.24	61.39	184	152.58	60.46
76	44.03	62.27	140	108.25	61.37	185	153.59	60.44
78	46.03	62.25	141	109.25	61.36	186	154.60	60.41
80	48.04	62.23	142	110.26	61.34	187	155.61	60.39
82	50.04	62.21	143	111.26	61.32	188	156.62	60.37
84	52.04	62.19	144	112.27	61.30	189	157.63	60.34
86	54.05	62.17	145	113.28	61.28	190	158.64	60.32
88	56.05	62.15	146	114.28	61.26	191	159.65	60.29
90	58.06	62.13	147	115.29	61.24	192	160.67	60.27
92	60.06	62.11	148	116.29	61.22	193	161.68	60.25
94	62.06	62.09	149	117.30	61.20	194	162.69	60.22
96	64.07	62.07	150	118.31	61.18	195	163.70	60.20
98	66.07	62.05	151	119.31	61.16	196	164.71	60.17
100	68.08	62.02	152	120.32	61.14	197	165.72	60.15
102	70.09	62.00	153	121.33	61.12	198	166.73	60.12
104	72.09	61.97	154	122.33	61.10	199	167.74	60.10
106	74.10	61.95	155	123.34	61.08	200	168.75	60.07
108	76.10	61.92	156	124.35	61.06	201	169.77	60.05
110	78.11	61.89	157	125.35	61.04	202	170.78	60.02
112	80.12	61.86	158	126.36	61.02	203	171.79	60.00
114	82.13	61.83	159	127.37	61.00	204	172.80	59.97
115	83.13	61.82	160	128.37	60.98	205	173.81	59.95
116	84.13	61.80	161	129.38	60.96	206	174.83	59.92
117	85.14	61.78	162	130.39	60.94	207	175.84	59.89
118	86.14	61.77	163	131.40	60.92	208	176.85	59.87
119	87.15	61.75	164	132.41	60.90	209	177.86	59.84
120	88.15	61.74	165	133.41	60.87	210	178.87	59.82
121	89.15	61.72	166	134.42	60.85	211	179.89	59.79
122	90.16	61.70	167	135.43	60.83	212	180.90	59.76

RELATIVE VALUE OF NON-CONDUCTORS

(C. E. Emery)

Non-conductors	Value	Non-conductors	Value
Wool felts	1.000	Loam, dry and open	.550
Mineral wool, No. 2	.832	Slacked lime	.480
Mineral wool, with tar	.715	Gas-house carbon	.470
Sawdust	.680	Asbestos	.363
Mineral wool, No. 1	.676	Coal ashes	.345
Charcoal	.632	Coke, in lumps	.277
Pine wood, across fibre	.553	Air space, undivided	.186

VALUES OF FUEL

HARD coal, stove or egg size, is the standard fuel on which boiler capacities are based. If other kinds are used, careful calculation is necessary to get the equivalent results. For small boilers, stove or nut coal should be used, but on the large boilers egg coal can be burned to good advantage.

PEA COAL—Experiments on power boilers have shown that 50 per cent. more power can be developed with the same grate surface when using anthracite egg coal as against anthracite pea coal (other conditions being equal). This does not mean that egg coal is more economical, but that with pea coal a larger boiler or a larger grate surface is necessary.

This is due to the fact that pea and smaller sizes of coal pack so much closer that the draft cannot get through the coal as easily, and on that account they yield up their heat more slowly. If, however, the conditions are properly considered, there is no reason why one ton of pea coal should not give up as much heat as a ton of the same grade of coal in the larger sizes, provided, of course, each lot is equally free from dirt and slate.

The draft of the chimney is the important factor in the burning of small coal. Unless the draft is very good, pea coal or smaller sizes cannot be burned successfully.

Soft coal (bituminous) requires more grate surface for the reason that it cakes together and the draft does not go through it so easily. It also requires more boiler power, for the reason that the soot cakes on the boiler surfaces and prevents (to some extent) the heat passing from the fire to the water.

Soft coal varies considerably in its heat value in different parts of the country, as will be seen by the following table of heat values for various sections of the United States.

For a basis of boiler rating anthracite coal is taken as having an average value of 12,500 B. T. U. (British thermal units) per pound of coal, and the table of heat values will indicate the relative values of soft coal.

AVERAGE WEIGHT OF COAL

One cubic foot of hard coal weighs about	50 pounds
One cubic foot of soft coal weighs about	40 pounds
One cubic foot of coke weighs about	28 pounds

HEAT VALUE OF VARIOUS COALS IN THE UNITED STATES

FROM LATEST GOVERNMENT AND OTHER REPORTS

State	Location or Name of Mine	Kind of Coal	Value in B. T. U. per lb.
Alabama	Bibb County	Bituminous	12,232 to 14,537
Alabama	Jefferson County	Bituminous	13,383 to 14,353
Alabama	Pratt City	Bituminous	13,900 to 14,500
Arkansas	Huntington County	Bituminous	12,100 to 12,550
Arkansas	Coal Hill	Bituminous	11,600 to 11,820
Colorado	Las Aruruas County	Bituminous	12,300 to 12,600
Colorado	Trinidad District	Bituminous	12,450 to 13,100
Colorado	Routt County	Bituminous	12,300 to 12,900
Illinois	Vermillion County	Bituminous	11,321 to 11,440
Illinois	Peoria County	Bituminous	10,890 to 13,373
Illinois	Staunton County	Bituminous	12,152 to 12,546
Illinois	Williamson County	Bituminous	11,622 to 12,110
Illinois	Franklin County	Bituminous	12,250 to 12,791
Illinois	St. Clair County	Bituminous	10,950 to 11,085
Illinois	Contine	Bituminous	10,000 to 11,000
Illinois	Mount Olive	Bituminous	11,200 to 11,800
Illinois	Christopher	Bituminous	11,100 to 11,500
Indiana	Block	Bituminous	10,200 to 10,450
Iowa	Milwaukee Pea	Bituminous	10,000 to 10,300
Iowa	What Cheer	Bituminous	8,000 to 8,400
Kansas	Cherokee County	Bituminous	12,132 to 13,966
Kansas	Englevale	Bituminous	11,026 to 12,547
Kansas	Crawford County	Bituminous	12,900 to 13,100
Kentucky	Hopkins County	Bituminous	11,500 to 12,000
Kentucky	Bell County	Bituminous	12,500 to 13,050
Kentucky	Hiller	Bituminous	13,500 to 14,000
Maryland	Barrellville	Bituminous	14,100 to 14,400
Maryland	Ceorge's Creek	Bituminous	13,911 to 14,397
Maryland	Garrett County	Bituminous	13,800 to 14,000
Missouri	Bevier	Bituminous	9,800 to 10,000
Missouri	Elston	Bituminous	12,500 to 12,700
New Mexico		Bituminous	11,500 to 11,800
Ohio	Hocking Valley	Bituminous	13,000 to 13,300
Ohio	Jackson County	Bituminous	11,500 to 11,700
Oklahoma	Cool	Bituminous	11,000 to 11,200
Pennsylvania	Wyoming District	Anthracite	11,560 to 12,000
Pennsylvania	Schuylkill Region	Anthracite	10,642 to 12,180
Pennsylvania	Plymouth Mine	Anthracite	13,071 to 13,581
Pennsylvania	Pittston	Anthracite	11,215 to 12,336
Pennsylvania	Scranton	Anthracite	10,500 to 12,000
Pennsylvania	Mid Valley	Anthracite	12,228 to 12,995
Pennsylvania	Kingston	Anthracite	13,449 to 14,000
Pennsylvania	Lehigh District	Anthracite	12,500 to 13,100
Pennsylvania	Allegheny County	Bituminous	12,827 to 13,824
Pennsylvania	Cambria County	Bituminous	14,435 to 14,936
Pennsylvania	Punxatawney	Bituminous	14,301 to 14,755
Pennsylvania	Youghiogheny	Bituminous	12,379 to 13,778
Pennsylvania	Somerset County	Bituminous	14,478 to 14,853
Pennsylvania	Clearfield County	Bituminous	14,247 to 14,597
Pennsylvania	West Newton	Bituminous	12,196 to 12,400
Tennessee	Campbell County	Bituminous	13,950 to 14,500
Texas	Fort Worth	Bituminous	9,450 to 11,800
Virginia	Tazewell County Pocahontas	Bituminous	14,460 to 14,650
Washington	Carbon Hill	Bituminous	12,200 to 12,850
West Virginia	Raleigh County	Bituminous	14,665 to 15,177
West Virginia	Fayette	Bituminous	14,950 to 15,363
West Virginia	Elk Garden	Bituminous	13,900 to 14,100
West Virginia	Sharon & Smithers	Bituminous	12,800 to 14,295
West Virginia	Oregon, Cepis & Welsh	Bituminous	13,925 to 14,867
West Virginia	New River	Bituminous	14,450 to 14,700

AIR REQUIRED FOR COMBUSTION

THE burning of a given quantity of fuel requires a definite amount of oxygen to properly consume it. The oxygen is contained in the air in sufficient quantities that three hundred (300) cubic feet of air will properly burn one pound of coal. If a less quantity of air is supplied, the combustion will not be good and a large amount of unconsumed gas will escape up the chimney with a corresponding waste of coal and a less efficient boiler. This fact shows the importance of a good chimney flue of sufficient capacity and a boiler room having an ample fresh air supply. The supply of air must enter under the grates of the boiler to support the combustion of the fuel. If a boiler is rated for 2000 feet steam capacity there must be developed 480,000 B. T. U. per hour to maintain this maximum capacity. Assuming the coal at a value of 12,500 B. T. U. per pound, and allowing that we can transmit 70 per cent of the heat into the work, this would require 54.7 pounds of coal per hour, and with a grate containing ten square feet it would mean a combustion of 5.4 pounds of coal per square foot of grate per hour. Such a boiler will require a chimney 12 inches in diameter, if round, or 12 x 12 inches if built square, as the corners of a square chimney are not effective. A chimney fifty feet high should have a draft equal to one inch of water (see page 000), and a capacity of 42,000 cubic feet per hour, not counting the friction of traveling through the fuel, boiler and flues to the chimney. This friction takes 60 per cent of the power of the chimney, thus reducing the actual air supply of such a chimney to 16,800 cubic feet per hour. The air needed to supply 54.7 pounds of coal per hour is 16,410 cubic feet. Any reduction of height or pressure must be compensated for by increased area.

CAPACITY AND DRAFT

THE coal capacity of the fire-box of a boiler does not determine its power, but does determine the length of time it can be operated with one charge of fuel.

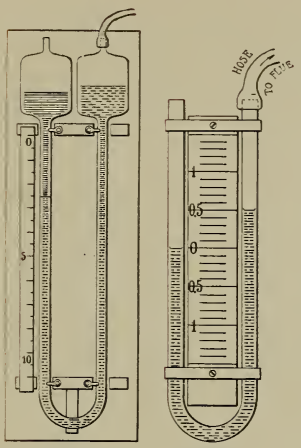
The time in which the coal will be consumed is governed by the strength of the draft and also the area of the flue, as unless the draft is strong enough and the chimmey of sufficient capacity to complete the combustion of the fuel in the stated time, the rated capacity cannot be developed.

The strength of the draft by siphon gauge should not be less than one-tenth of an inch of water. It should really be two-tenths of an inch to be sure of a good draft, and the area of the size needed for the boiler attached to it.

PRESSURE IN INCHES OF WATER BY SIPHON DRAFT GAUGE

Height Water Inches	Pressure per Pound	Velocity Feet per Second	Velocity Feet per Minute	Height Water Inches	Pressure per Pound	Velocity Feet per Second	Velocity Feet per Minute
.1	.521	15.05	903	1.1	5.731	49.9	2994
.15	.781	18.17	1090	1.15	5.991	57.0	3060
.2	1.042	21.3	1278	1.2	6.252	52.1	3126
.25	1.302	23.05	1090	1.25	6.512	53.2	3189
.3	1.563	26.06	1564	1.3	6.773	54.2	3252
.35	1.823	28.08	1685	1.35	7.033	55.3	3315
.4	2.084	30.1	1806	1.4	7.294	56.3	3378
.45	2.344	31.76	1911	1.45	7.554	57.4	3415
.5	2.605	33.6	2016	1.5	7.815	58.2	3492
.55	2.865	35.2	2112	1.55	8.075	59.3	3523
.6	3.126	36.8	2208	1.6	8.336	60.2	3612
.65	3.386	38.3	2298	1.65	8.596	61.3	3666
.7	3.647	39.8	2388	1.7	8.857	62.	3720
.75	. .	41.2	2469	1.75	9.117	63.1	3774
.8	4.168	42.5	2550	1.8	9.378	63.8	3828
.85	3.907	43.8	2628	1.85	9.638	64.9	3882
.9	4.689	45.1	2706	1.9	9.899	65.6	3936
.95	4.949	46.3	2778	1.95	10.159	66.7	3987
1.0	5.210	47.5	2850	2.	10.420	67.3	4038

DRAFT GAUGES



THE illustrations shown are two appliances for testing the draft in a chimney. The U-tube is very widely used for this and other purposes. It is used for testing the pressure in gas mains, and one can be obtained at almost any gas company's office, or one can be made by obtaining a U-tube from a chemist and making a scale to suit. One end of this tube is connected to the chimney or smoke pipe by a small rubber hose, and the strength of the draft will be shown by lifting the water in the tube, the strength being indicated on the gauge. The other gauge is known as the Barrus Gauge, and is the same in principle as the U-tube, except that the enlargements at the top multiply the reading four times and thus give a more accurate reading, as on the gauge 2/10 of an inch would show 8/10, which makes it more easy to detect an error. With this gauge two kinds of liquids are used, in one side oil and in the other alcohol, which may be colored pink; and as these liquids do not mix, an accurate reading can be secured. Such an instrument must be calibrated to the equivalent of the water in a U-tube.

CHIMNEY FLUES

EFFECTS OF A BAD DRAFT

A POOR draft means imperfect combustion and a waste of fuel for the reason that two-thirds of the value of the fuel forms into gas, and if the air supply is not sufficient this gas will not burn, merely passing off with the smoke and being lost. With such conditions more coal will be used and the boiler will fall short of its capacity.

STRENGTH OF DRAFT NEEDED

While it is necessary to have a given area in a chimney, this alone will not be sufficient. The chimney must be of sufficient height to give the velocity necessary to generate a good draft. The chimney must extend four feet above the highest point of the roof. If there should be buildings near by that are higher than the chimney there will be cause for a defective draft. Large trees close to the house will at times also interfere with the draft of a chimney.

Chimneys should be set on inside walls if possible; if set on outside walls the chimney breast should extend inside the house in preference to extending outside. This for the reason that heat is necessary to produce velocity in the chimney, and so much heat is lost from the outside wall that chimneys so located are apt to have poor drafts.

In case it is necessary to have a long smoke-pipe from the heater to the chimney, great care is necessary to prevent loss of heat. Such a smoke-pipe should be one or two inches larger than regular and should have an upward grade to chimney. It should have a good coating of asbestos covering and there should be as few turns in the pipe as possible. Care should be taken that the smoke-pipe does not project too far into the chimney, as doing so will obstruct the draft. If the flue is oblong in shape better results will be obtained if the smoke-pipe can enter on the narrow side, as this will allow the smoke and escaping gases more room in which to change their course from the horizontal smoke-pipe to the vertical flue.

If the fire does not burn properly, or if the boiler does not work up to its capacity, the draft conditions should be examined at once.

In looking over the chimney and connecting boiler to it, it is well

First. To see that there are no other openings into the boiler flue, either above or below the boiler smoke-pipe, special care being exercised at the base of the flue that the boiler flue does not connect with the other flues through the soot pocket.

Second. That the division walls of the chimney, if it contains more than one flue are carried up to the top of the chimney, so that each flue is independent of the others throughout its entire length.

Third. That the area of the chimney flue is maintained full size throughout its entire length and is free from all obstructions, such as loose brick, mortar, etc., that might have become lodged in it.

CHIMNEY FLUES—*Continued*

Fourth. That chimney extends above the highest point of the roof or other immediate surrounding elevation. This is quite important, and failure to observe same may be looked to as cause for poor draft.

Fifth. That flue is at least eight inches in depth and never less in area than size of smoke-pipe given by boiler manufacturer.

Sixth. That the boiler sets as near the chimney as possible, thus shortening length of smoke-pipe, which is desirable.

Seventh. That the smoke-pipe does not project into chimney too far and thus lessen the area of flue at this important point, where the smoke leaves pipe and enters flue.

For the reason that local conditions must of necessity govern the size and height of a chimney, a great deal depends upon the judgment of the heating engineer, and it would be impossible to apply the same rule in every instance. Professor William Kent gives a formula which is approved by Professor R. C. Carpenter, and from which has been compiled the following table, which we believe heating engineers will find of material assistance when considering chimney flues. This table gives the diameter of round chimneys in inches for various heights. Square chimneys with sides equal to the diameter are considered equivalent.

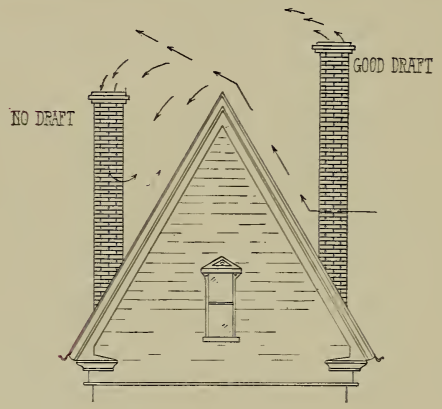
CHIMNEY FLUES

Steam *Square Feet Rated Boiler Capacity	Water *Square Feet Rated Boiler Capacity	Height of Chimney in Feet					
		30	40	50	60	80	100
250	375	7.0					
500	750	9.2	8.8	8.2	8.0		
750	1,125	10.8	10.2	9.6	9.3	8.8	8.5
1,000	1,500	12.0	11.4	10.8	10.5	10.0	9.5
1,500	2,250	14.4	13.4	12.8	12.4	11.5	11.2
2,000	3,000	16.3	15.2	14.5	14.0	13.2	12.6
3,000	4,500	18.5	18.2	17.2	16.6	15.8	15.0
4,000	6,000	22.2	20.8	19.6	19.0	17.8	17.0
5,000	7,500	24.6	23.0	21.6	21.0	19.4	18.6
6,000	9,000	26.8	25.0	23.4	22.8	21.2	20.2
7,000	10,500	28.8	27.0	25.5	24.4	23.0	21.6
8,000	12,000	30.6	28.6	26.8	26.0	24.2	23.4
9,000	13,500	32.4	30.4	28.4	27.4	25.6	24.4
10,000	15,000	34.0	32.0	30.0	28.6	27.0	25.4

*Indirect radiation should be made equivalent to direct radiation by adding 50 per cent.

CHIMNEY FLUES—*Continued*

The building in which a heater is to be placed should be carefully examined, or if the fitter is figuring from the plans great care should be taken to ascertain accurately just what kind of a chimney such plans provide. It should be of proper size and of sufficient height to insure a good draft.

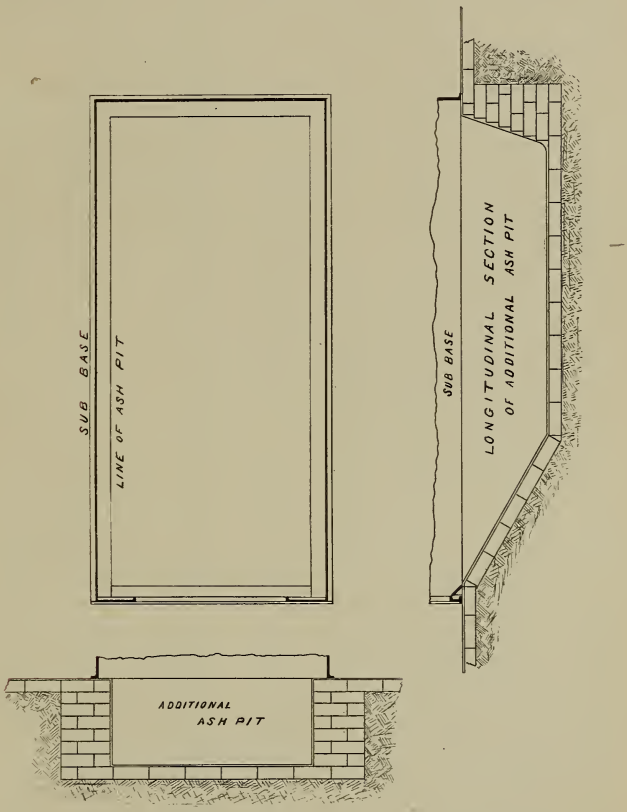


Above illustrations show the location and height of chimneys on a house tending to make a good and poor draft. A little care and attention to the conditions will save a lot of trouble.

Chimneys which make a turn to go around a fire-place or which are offset from a vertical position will almost always prove defective unless care is exercised to make the offset very smooth and the area of the chimney larger than if flue be carried "straight up."

FOUNDATIONS

IN setting heating boilers, either round or square, the contractor should first note that the foundation is level and firm. A space left underneath the base allows the air to draw in ashpit, the same as when the draft door is open. This air leakage accounts for the large consumption of fuel often found in residence heating boilers, as about 95 per cent of all burned out grate bars are directly traceable to the accumulation of ashes under grates.



It will be found of much value, when the conditions will permit, to deepen the ashpit by either making a raised foundation of brick under edge of boiler, or by excavating and cementing the sides and ends, as shown by the illustration above.

EXTREME VARIATION OF TEMPERATURE IN THE UNITED STATES

States	Cities	Highest	Lowest	States	Cities	Highest	Lowest
Ala.	Mobile	101	11	Mo.	St. Louis	106	—22
	Montgomery.	107	5		Springfield	99	—11
Ariz.	Grant, Fort	103	7	N. C.	Charlotte	102	— 5
	Prescott	103	—18		Hatteras	92	8
	Yuma	118	22		Wilmington	103	9
Ark.	Fort Smith	104	— 7	Neb.	North Platte	107	—35
	Little Rock	102	— 5		Omaha	105	—32
Cal.	Red Bluff	112	18		Valentine	106	—35
	Sacramento	108	19	Nev.	Winnemuc'a.	104	—28
	San Diego	101	32	N. D.	Bismark	105	—44
Colo.	Denver	105	—29		Buford, Ft.	107	—49
	Las Animas	105	—26	N. H.	Manchester	96	—11
	Montrose	98	—20	N. J.	Atlantic City	99	— 7
Conn.	New Haven	100	—14		Cape May	91	1
	New London	93	—10		New Brunsw.	98	—12
Del.	Del Break'r.	93	1	N. M.	Santa Fe	97	—13
Dist. of Col.	Washington	104	—14		Stanton, Ft.	95	—18
				N. Y.	Albany	98	—18
Fla.	Jacksonville.	104	15		N. Y. City	100	— 6
	Key West	100	41		Oswego	100	—23
	Pensacola	99	15	Ohio	Cincinnati	104	—12
Ga.	Atlanta	100	— 2		Columbus	103	—20
	Augusta	105	6		Toledo	99	—16
	Savannah	105	12	Ore.	Portland	99	— 2
Idaho	Boise City	107	—28		Roseburg	102	— 6
Ill.	Cairo	103	—16		Umatilla	110	—24
	Chicago	100	—23	Pa.	Erie	94	—16
	Springfield	102	—22		Philadelphia	102	— 5
Ind.	Indianapolis.	101	—25		Pittsburg	103	—12
In. Tr.	Sill, Fort	107	— 9	R. I.	Block Island	88	— 4
Iowa	Des Moines	104	—30		Newport	92	— 8
	Dubuque	101	—32	S. C.	Charleston	104	10
	Keokuk	104	—24	S. D.	Yankton	103	—34
Kan.	Dodge City	108	—20	Tenn.	Chattanooga	101	— 7
	Concordia	104	—25		Memphis	102	— 8
	Leavenworth	107	—29		Nashville	104	—10
Ky.	Louisville	105	—20	Texas	Elliott, Ft.	108	—14
La.	New Orleans	97	15		Brownsville	102	18
	Shreveport	107	1		El Paso	113	— 5
Maine	Eastport	88	—21	Utah	Palestine	102	0
	Portland	97	—17		Frisco	93	0
Md.	Baltimore	102	— 6		Salt Lake	102	—20
Mass.	Boston	101	—13	Vt.	Burlington	96	—25
	Springfield	94	—14	Va.	Lynchburg	102	— 5
Mich.	Grand Haven	92	—24		Norfolk	102	4
	Marquette	100	—27	Wash	Dayton	109	—26
	Port Huron	99	—25		Olympia	97	— 2
Minn.	Duluth	99	—41	W. V.	Tatoosh Isl.	78	14
	St. Paul	100	—41	Wis.	Morgantown.	97	—10
	St. Vincent	103	—54		La Crosse	101	—43
Miss.	Vicksburg	101	— 3		Milwaukee	100	—25
Mon.	Assinb'd, Ft.	108	—55	Wyo.	Bridger, Ft.	89	—42
	Custer, Ft.	106	—48		Cheyenne	100	—38
	Poplar River	110	—63		Wash'kie Ft.	100	—54

The minus sign (—) indicates temperature below zero.

GALVANIZED SHEET IRON

SIZES AND WEIGHTS

Gauge	Size	Ounces per Sq. Ft.	Weight of Sheet in Pounds	Gauge	Size	Ounces per Sq. Ft.	Weight of Sheet in Pounds
14	24 x 84	52½	46	23	36 x 84	20½	27
14	26 x 84	52½	49¼	23	40 x 84	20½	20
14	28 x 84	52½	53¾	23	24 x 96	20½	20½
14	30 x 84	52½	57½	23	26 x 96	20½	22¼
16	24 x 84	42½	37	23	28 x 96	20½	24
16	26 x 84	42½	40¼	23	30 x 96	20½	25¾
16	28 x 84	42½	43½	23	32 x 96	20½	27½
16	30 x 84	42½	46½	23	36 x 96	20½	31
16	24 x 96	42½	42⅔	23	40 x 96	20½	34⅓
16	26 x 96	42½	46	23	44 x 96	20½	37¾
16	28 x 96	42½	49¾	24	24 x 84	18½	16¼
16	30 x 96	42½	53	24	26 x 84	18½	17
18	24 x 84	31½	30¼	24	28 x 84	18½	19
18	26 x 84	34½	32	24	30 x 84	18½	20¼
18	28 x 84	34½	35¼	24	32 x 84	18½	22
18	30 x 84	34½	37¾	24	36 x 84	18½	24
18	36 x 84	34½	45¼	24	40 x 84	18½	27
18	24 x 96	34½	34⅔	24	24 x 96	18½	18½
18	26 x 96	34½	36½	24	26 x 96	18½	20
18	28 x 96	34½	40⅓	24	28 x 96	18½	21¾
18	30 x 96	34½	42¼	24	30 x 96	18½	23
18	36 x 96	34½	51¾	24	32 x 96	18½	24¾
19	28 x 84	30½	31	24	36 x 96	18½	27¾
20	24 x 84	26½	23	24	40 x 96	18½	31
20	26 x 84	26½	25	24	44 x 96	18½	34
20	28 x 84	26½	27	26	24 x 84	14½	12¾
20	30 x 84	26½	29	26	26 x 84	14½	13¾
20	36 x 84	26½	34¾	26	28 x 84	14½	14¾
20	24 x 96	26½	26⅔	26	30 x 84	14½	16
20	26 x 96	26½	28¾	26	32 x 84	14½	17
20	28 x 96	26½	31	26	36 x 84	14½	19
20	30 x 96	26½	33	26	24 x 96	14½	14⅓
20	36 x 96	26½	42	26	26 x 96	14½	15¾
22	24 x 84	22½	19¾	26	28 x 96	14½	17
22	26 x 84	22½	21¼	26	30 x 96	14½	18¼
22	28 x 84	22½	23	26	32 x 96	14½	19½
22	30 x 84	22½	24¼	26	36 x 96	14½	21¾
22	36 x 84	22½	29½	28	24 x 84	12½	11
22	40 x 84	22½	33	28	26 x 84	12½	11¾
22	24 x 96	22½	22	28	28 x 84	12½	12¾
22	26 x 96	22½	24¼	28	30 x 84	12½	13¾
22	28 x 96	22½	26⅓	28	32 x 84	12½	14½
22	30 x 96	22½	28	28	36 x 84	12½	16¼
22	36 x 96	22½	33⅔	28	24 x 96	12½	12⅔
22	40 x 96	22½	37¾	28	26 x 96	12½	13½
23	24 x 84	20½	18	28	28 x 96	12½	14½
23	26 x 84	20½	19½	28	30 x 96	12½	15½
23	28 x 84	20½	21	28	32 x 96	12½	16½
23	30 x 84	20½	22½	28	36 x 96	12½	18½
23	32 x 84	20½	24				

AREAS AND CIRCUMFERENCES OF CIRCLES

Diameter	Circumference	Area	Diameter	Circumference	Area
1	3.141	.785	39	122.522	1194.59
2	6.283	3.141	40	125.664	1256.64
3	9.424	7.068	41	128.806	1320.26
4	12.566	12.566	42	131.947	1485.44
5	15.708	19.635	43	135.089	1452.21
6	18.849	28.274	44	138.230	1520.53
7	21.991	38.484	45	141.372	1590.43
8	25.132	50.265	46	144.514	1661.91
9	28.274	63.617	47	147.655	1734.95
10	31.416	78.540	48	150.797	1809.56
11	34.557	95.033	49	153.938	1885.74
12	37.699	113.098	50	157.080	1963.50
13	40.840	132.733	51	160.222	2042.82
14	43.982	153.938	52	163.363	2123.72
15	47.124	176.715	53	166.505	2206.19
16	50.265	201.062	54	169.646	2290.23
17	53.407	226.981	55	172.788	2375.83
18	56.548	254.467	56	175.930	2463.01
19	59.690	283.529	57	179.071	2551.76
20	62.832	314.160	58	182.213	2642.09
21	65.973	346.361	59	185.354	2733.98
22	69.115	380.134	60	188.496	2827.44
23	72.256	415.477	61	191.638	2922.47
24	75.398	452.390	62	194.779	3019.08
25	78.540	490.875	63	197.921	3117.25
26	81.681	530.930	64	201.062	3217.00
27	84.823	572.557	65	204.204	3318.31
28	87.964	615.754	66	207.346	3421.20
29	91.106	660.521	67	210.487	3525.66
30	94.248	706.860	68	213.629	3631.69
31	94.389	754.769	69	216.770	3739.29
32	100.531	804.250	70	219.912	3848.46
33	103.673	855.301	71	223.054	3959.20
34	106.814	907.922	72	226.195	4071.51
35	109.956	962.115	73	229.337	4185.40
36	113.098	1017.878	74	232.478	4300.85
37	116.239	1075.213	75	235.620	4417.87
38	119.381	1134.118	76	238.761	4536.47

To find circumference of a circle when diameter is given, multiply the given diameter by 3.1416.

To find the diameter of a circle when circumference is given, multiply the given circumference by .31831.

Square diameter and multiply by .7854 to obtain area of a circle.

ASBESTOS CEMENT REQUIRED FOR COVERING CAPITOL BOILERS 1½ INCHES THICK

STEAM		WATER	
Number of Boiler	Pounds	Number of Boiler	Pounds
425 and 1425	180	425 and 1425	160
525 and 1525	220	525 and 1525	200
625 and 1625	250	625 and 1625	230
725 and 1725	280	725 and 1725	260
825 and 1825	320	825 and 1825	300
537 and 1537	350	537 and 1537	350
637 and 1637	430	637 and 1637	430
737 and 1737	480	737 and 1737	480
837 and 1837	550	837 and 1837	550
937 and 1937	600	937 and 1937	600
1037 and 2037	650	1037 and 2037	650
748 and 1748	700	748 and 1748	700
848 and 1848	800	848 and 1848	800
948 and 1948	900	948 and 1948	900
1048 and 2048	1000	1048 and 2048	1000
1148 and 2148	1100	1148 and 2148	1100
1248 and 2248	1200	1248 and 2248	1200
1348 and 2348	1300	1348 and 2348	1300

CAPITOL SOLAR BOILERS

702S	150	702W	150
1002S	150	1002W	150
1003S	150	1003W	150
1004S	150	1004W	150
1402S	200	1402W	200
1403S	200	1403W	200
1404S	200	1404W	200
1803S	200	1803W	200
1804S	200	1804W	200
1805S	200	1805W	200
2403S	300	2403W	300
2404S	300	2404W	300
2405S	300	2405W	300
3303S	400	3303W	400
3304S	400	3304W	400
3305S	400	3305W	400

Asbestos should be applied as follows: About twenty-four hours before using, mix with water to the consistency of thin mortar, enough asbestos for the first coat, which should be one-half of the entire thickness of the covering, and cover boiler, throwing on by handfuls with just enough force to make it stick without packing too solidly. The more loosely it is applied the more effective. When the first coat is thoroughly dry, apply the second coat in the same manner, having a thicker consistency. The third coat should be applied with a trowel and brought to a smooth finish. It is important for good results to allow each coat to thoroughly dry before applying the next. A canvas or heavy muslin jacket can now be pasted over the asbestos and made moisture-proof by painting with asphaltum. This will insure a permanent covering. Asbestos is supplied in bags containing 50, 75 and 100 pounds each, see page 164.

ASBESTOS CEMENT REQUIRED TO COVER FURMAN AND SUNRAY BOILERS 1½ INCHES THICK

FURMAN SECTIONAL

Number	Pounds
184	200
185	225
186	250
187	275
188	300
225	275
226	300
227	325
228	350
276	350
277	400
278	450
279	500
337	500
338	550
339	600
340	650
387	650
388	750
389	850
390	950
391	1050

SUNRAY SECTIONAL

Number	Pounds
54 E	225
55 E	250
56 E	275
57 E	300
58 E	325
95 A	325
96 A	375
97 A	425
98 A	475
326	400
327	450
328	500
329	550
235	550
236	610
237	670
238	730
239	790
240	850
WN 276	750
WN 277	850
WN 278	950
WN 279	1050
WN 280	1150
WN 281	1250

FURMAN ROUND

Number	Pounds
16-0	150
16-1	150
16-2	150
19-0	200
19-1	200
19-2	200
22-0	200
22-1	200
22-2	200
22-3	200
25-0	300
25-1	300
25-2	300
25-3	300
29-0	400
29-1	400
29-2	400
29-3	400

Sufficient cement is sent out with Sunray Boilers to make them fire and smoke tight, but not to cover the boiler. 50 pounds is sent out with Nos. 54-E and 55-E; 75 pounds with Nos. 56-E and 57-E; 75 pounds with Nos. 95-A and 96-A; 100 pounds with Nos. 97-A and 98-A; 100 pounds with Nos. 326 and 327; 150 pounds with Nos. 235 and 236; 200 pounds with Nos. 237 and 238; 250 pounds with Nos. 239 and 240; 300 pounds with Nos. WN278 and WN279; 400 pounds with Nos. WN280; 200 pounds with Nos. WN276 and 277.

Asbestos is supplied in bags containing 50, 75 and 100 pounds each. See page 164.

TELEGRAPH CODE

SPECIAL NOTICE

PLEASE bear in mind the following in using the telegraph code:

1. Telegraph only when the matter is urgent. When a letter will answer the purpose, it is *surer*, as errors in transmission cannot then occur.

2. Where a blank occurs in a sentence, the word or words supplying the blank must *always follow* the code word of the sentence.

3. Except in cablegrams, ten words are as cheap as any number less. Avoid code where the matter can be covered in ten words without it.

4. When ordering, always specify *hard coal* or *soft coal* boilers, for *steam* or *water*, as the case may be.

5. Write plainly and begin each code word with a capital letter.

QUOTATIONS AND CORRESPONDENCE

At what price and how soon can you furnish	Dab
Quote best price on	Dabbling
Quote best price on following radiation	Dado
Wire reply quick	Daft
Specifications to follow within	Dawning
Will wire you to-morrow morning	Dagger
Will write you to-morrow morning	Dainty
Have written	Dairymaid
Answer by first mail	Daisy
Full particulars in letter of	Dale
Have received no reply from you to our letter of	Dally
Referring to your telegram of ——	Damask
Referring to your letter of ——	Dame
Referring to our telegram of ——	Dampness
Referring to our letter of ——	Damsel
Referring to telephone communication to-day	Dance
Do not understand the meaning of ——	Dandy
We quote you for immediate acceptance	Danish
F. O. B. factory	Deacon

QUOTATIONS AND CORRESPONDENCE—*Continued*

F. O. B. factory, published freight allowance	Danger
F. O. B. factory less actual freight up to 30 cents cwt.	Dangle
F. O. B. New York warehouse	Deaden
F. O. B. Boston warehouse	Deafness
F. O. B. Philadelphia warehouse	Deanery
F. O. B. Chicago warehouse	Debater
F. O. B. Omaha warehouse	Debenture
F. O. B. Kansas City warehouse	Debonair
F. O. B. Denver warehouse	Decanter
Terms, 30 days, 2 per cent 10 days	Decapitate
Terms, 60 days, 2 per cent 10 days	Darn
Terms, net cash	Dared
Terms, draft and B/L	Decay
What is carload freight rate to	Decigram
What is less than carload freight rate to	Dapper
Best carload freight quoted is	Dare
Best less-than-carload freight rate quoted is	Darkness
Will wire you freight rate soon as received	Darken
Please reply at once to our telegram	Darling

ORDERS AND SHIPMENTS

Ship immediately by freight	Earl
Ship immediately by express	Eater
Ship immediately by express prepaid	Easterly
Ship by first boat	Empire
Ship by best route	Earning
Ship immediately and follow with tracer	Earthquake
Can you ship immediately?	Emperor
Can ship immediately	Elder
Can ship immediately if tapping is regular, otherwise a day or two may be necessary, but can make prompt shipment	Emerge
Can't ship quickly as per your order, but can ship promptly	Emption
Ship by same route as our order No.	Eclipse
Ship what you can at once, balance soon as possible	Edict
Do not hold for other orders, but rush without delay	Edify
When will you ship order (No. or date)	Educate
When and by what route did you ship our order	Effigy
When can you make shipment	Editor
Will ship in about	Elect
Your order No.—— was shipped	Element
Order No. —— is ready for shipment	Eligible
Your order ———— is ready for shipment except ———— Shall we make shipment?	Encompass
Hold for instructions. Order (No.)	Elbowing

ORDERS AND SHIPMENTS—*Continued*

Add to our order (No.)	Egg
Omit ——— from our order (No.)	Elate
Substitute on our order (No.)	Elastic
Duplicate our order (No.)	Electo
Wire trace our order (No.)	Effuse
Give date or number of order referred to	Elephant
Ship as small lot unless car going at once	Edition
We have no car going for —— days	Elevator
Shall we forward as small lot?	Elfin
Will send shipping instructions by mail	Edentate
Shipping instructions for order (No.)	Edge
Enter order at your quotation of	Echo
Enter order as per our inquiry of	Ebonized
Send us bill of lading covering our order (No.)	Eaves
Will mail you to-day bill of lading covering order (No.)	Energetic
Ship with draft attached to bill of lading	Easel
Will ship your order	Enfeebled
When will car be shipped containing our order	Engender
Wire routing on shipment of our order	Enkindle
Routing on your shipment is as follows	Enlighten
Wire instructions	Elixir
Order (No.) has not been shipped	Elope
Your order does not specify steam or water. Wire which is wanted	Elusion
Change our order (No.) to read	Embalm
Referring to your order	Embankment
Referring to our order	Embargo
Do not find any order from you	Emblem
We cannot promise definitely, but will give best attention	Emboss
Include in car for —— which left	Embrace
We cannot furnish	Emetic
Must have —— at once. Can't wait for	Emigrant
Latter part of this week	Enriching
First of next week	Enslave
Latter part of next week	Entertainer

TABLE OF TIME

1 day	Swelling	12 days	Syenite
2 days	Swelter	1 week	Syllabic
3 days	Swerving	2 weeks	Sylphlike
4 days	Swiftness	3 weeks	Symbolic
5 days	Swimming	1 month	Sagacious
6 days	Swingle	2 months	Symmetral
10 days	Swooning	3 months	Sympathetic

NUMERALS

To be used when giving quantities, order numbers, weights, dollars and cents, etc.

1 . . .	ON	6 . . .	SI	Repeat . .	X
2 . . .	TO	7 . . .	VE	Dollars . .	DO
3 . . .	TH	8 . . .	EI	Feet . . .	FE
4 . . .	FO	9 . . .	NI	Discount . .	Dis.
5 . . .	IV	0 . . .	OH		

EXAMPLES

10155. 1–on 0–oh 1–on 5–iv 5–x (used instead of repeating iv —onohonivx.

$146.80. 1–on 4–fo 6–si dollars do 8–ei 0–oh—onfosidoeioh.

1,100 feet. 1–on 1–x 0–oh 0–x feet–fe—onxohxfe.

14,000. 1–on 4–fo 0–oh 0–x 0–oh (oh is repeated to avoid having two x's)—onfooxoh.

In writing telegram use all small letters and join together to make one complete word. To avoid confusion on long numbers it is sometimes advisable to print the characters. In that case, use all capitals, viz.: 1468–ONFOSIEI.

An easy method of deciphering can be used by separating every two letters, starting at the left, except where X appears.

ivohxdotosi—iv oh x do to si—500 dollars 26 $500.26.

HEIGHT OF RADIATOR

	Inches High		Inches High
Nabbing	12½	Nappal	20½
Nadir	13	Narcissus	22
Naiad	14	Narcotic	23
Naggy	14½	Narrate	26
Nailer	16½	Narrify	32
Namesake . . .	17	Narwhal	38
Napery	18	Nasal	44
Naptha	20	Nasturtium . . .	45

NUMBER OF SECTIONS

	Sections		Sections
Oatmeal	2	Objective	8
Obdurate	3	Oblation	9
Obeisant	4	Oblique	10
Obelisk	5	Oblivion	11
Obesity	6	Oblong	12
Obfuscate	7	Oboe	13

NUMBER OF SECTIONS—*Continued*

	Sections		Sections
Obscurity	14	Occult	26
Obsequy	15	Occupation	27
Observance	16	Octant	28
Obsession	17	Octillion	29
Obstacle	18	Octonary	30
Obstinate	19	Occular	31
Obtrude	20	Oddity	32
Obtundent	21	Odeon	33
Obvention	22	Odorate	34
Obvolute	23	Offertory	35
Occasional	24	Offspring	36
Occident	25		

TAPPING INSTRUCTIONS

¾-inch single pipe	Tablature
¾ x ¾-inch	Tableau
1 x ¾-inch	Taciturn
1-inch single pipe	Taffeta
1 x 1-inch	Tactician
1¼ x ¾-inch	Taffrail
1¼ x 1-inch	Taintless
1¼ x 1¼-inch	Tailoress
1¼-inch single pipe	Talisman
1½ x 1-inch	Talmud
1½ x 1¼-inch	Tamarind
1½ x 1½-inch	Tandems
1½-in. single pipe	Tangency
2 x 1½-inch	Tangling
2-inch single pipe	Tannery
2 x ½-inch	Tailor
1½ x ½-inch	Tame
1¼ x ½-inch	Tamkin
1 x ½-inch	Tearing
¾ x ½-inch	Tay
Tapped right hand	Tibal
Tapped for extreme top of first section	Timorous
Tapped for extreme top of second section	Tincture
Tapped underneath radiator bottom of first section	Tinkling
Tapped underneath radiator bottom of second section	Tinseled
Tapped for ¼-inch air valve	Tipstaff
All to have extra high solid legs so that distance from floor to center of supply tappings shall be ——inches	Titular
Tapped left hand	Ticklish
Tapped for single pipe steam as per list	Tidiness
Tapped for double pipe steam as per list	Tidology
Tapped for top supply and bottom return on same end	Tillage
Tapped for top supply and bottom return opposite ends	Timbrel
Tapped for both supply and return tappings at bottom	Timidity
Tapped regular as per list	Tinning
Tapped for Weber System	Tidbit
Tapped for Paul System	Tiby
Tapped for Webster System	Traducent
Tappped at "A"	Traceable
Tapped at "B"	Trachea
Tapped at "C"	Trackless
Tapped at "D"	Tractable
Tapped at "E"	Tractarian
Tapped at "F"	Tractility
Tapped at "G"	Tradeful
Tapped at "H"	Tradition

CAPITOL RADIATORS

Puritan one-column, steam	Handy
Puritan one-column, water	Haggard
Puritan two-column, steam	Heather
Puritan two-column, water	Hickory
Puritan three-column, steam	Hillock
Puritan three-column, water	History
Puritan four-column, steam	Halibut
Puritan four-column, water	Halter
Puritan five-column, steam	Hanker
Puritan window, five-column, water	Happiness
Florentine one-column, steam	Hamlet
Florentine one-column, water	Haughty
Florentine two-column, steam	Harrow
Florentine two-column, water	Hanson
Florentine three-column, steam	Hammer
Florentine three-column, water	Harbor
Florentine four-column, steam	Hinder
Florentine four-column, water	Harass

TRITON RADIATORS

Triton one-column, plain, steam	Cry
Triton one-column, plain, water	Crayon
Triton two-column, plain, steam	Cow
Triton two-column, plain, water	Calf
Triton three-column, plain, steam	Canvas
Triton three-column, plain, water	Cart
Triton four-column, plain, steam	Culpable
Triton four-column, plain, water	Cultivator
Triton five-column, plain, steam	Cunning
Triton five-column, plain, water	Curator
Triton one-column, ornamental, steam	Cavalier
Triton one-column, ornamental, water	Cavalry
Triton two-column, ornamental, steam	Censure
Triton two-column, ornamental, water	Centaur
Triton three-column, ornamental, steam	Caution
Triton three-column, ornamental, water	Cause
Triton four-column, ornamental, steam	Cave
Triton four-column, ornamental, water	Caverns
Triton five-column, ornamental, steam	Crew
Triton five-column, ornamental, water	Creep
Triton Flue, steam	Candy
Triton Flue, water	Clay

GRECIAN RADIATORS

Grecian one-column, plain, steam	Entity
Grecian one-column, plain, water	Entwine
Grecian two-column, plain, steam	Enervate
Grecian two-column, plain, water	Enclouded
Grecian three-column, plain, steam	Endure
Grecian three-column, plain, water	Enchase
Grecian four-column, plain, steam	Enamour
Grecian four-column, plain, water	Endivement

SUN AND UTILITY RADIATORS

Sun two-column, steam	Ennoble
Sun two-column, water	Enode
Sun three-column, steam	Enliven
Sun three-column, water	Enmity
Utility six-column, steam	Enjoyment
Utility six-column, water	Envenom

ATHENIAN WALL RADIATORS

Athenian Wall, 5-foot section, steam	Contraband
Athenian Wall, 5-foot section, water	Cancerate
Athenian Wall, 7-foot section, steam	Clincher
Athenian Wall, 7-foot section, water	Contour
Athenian Wall, 9-foot section, steam	Continuate
Athenian Wall, 9-foot section, water	Cruciform

INDIRECT RADIATORS

Champion Indirect	Englut
Pin Indirect, steam, 10 feet	Export
Pin Indirect, water, 10 feet	Expose
Pin Indirect, steam, 15 feet	Caxton
Pin Indirect, water, 15 feet	Ceiling
Pin Indirect, steam, 20 feet	Club
Pin Indirect, water, 20 feet	Cudgel
Not assembled	Currycomb
Assembled with Push Nipples	Curliness
Assembled with R. and L. Screw Nipples	Cutwater
Arranged for Wall Brackets	Culinary

SPECIAL RADIATORS

Circular for water	Playmate
Circular for steam	Plaything
Corner for water	Plea
Corner for steam	Pleader
Dining room for water	Pleasance
Dining room for steam	Pleasure
With saddles for marble top	Plebeian
With spikes in end section, for marble top	Plenal

ATHENIAN PANTRY RADIATOR

No. 1	No. 2	No. 3	No. 4	No. 5
Pliable	Pliform	Plighter	Plodding	Plough

RADIATOR MISCELLANIES

Washed and cleaned for vacuum system	Probation
Triton Three-column Box Bases	Probative
Triton Flue Box Bases	Probity
Puritan and Florentine Box Bases	Procreate
Triton Wall Boxes	Procedure
Sun Box Bases	Procession

ATHENIAN RADIATOR BRACKETS

R No. 1	R No. 2	R No. 3
Proclivity	Proctor	Prodigal

S	T	U	V
Prodigious	Professor	Profuse	Profusion

RADIATOR REPAIRS

Supply Steam Leg Section	Ablative
Supply Steam Leg Section, with supply and return at bottom same end	Ablution
Return Steam Leg Section, open hub	Abnegate
Return Steam Leg Section, blank hub	Aboard
Supply Water Leg Section	Abolition
Return Water Leg Section	Abreast
Intermediate Steam Section	Abroach
Intermediate Water Section	Abrogate
Middle Steam Leg Section	Abrupt
Middle Water Leg Section	Abscess

RADIATOR REPAIRS—*Continued*

Slip Nipples for steam radiators	Abscond
Slip Nipples for water radiators	Absolver
Bushings, 2 x ¾ inches	Abstain
Bushings, 2 x 1 inches	Abstemious
Bushings, 2 x 1¼ inches	Abstinence
Bushings, 2 x 1½ inches	Abstruse
Plugs, 2 inches	Abundance
Plugs, 1½ inches	Abutment
Screw Nipples for steam radiation	Acacia
Screw Nipples for water radiation	Academic
Right and Left Screw Nipples with hexagon centers	Acceding

IMPROVED CAPITOL BOILERS

25 SERIES

No.	Steam	Water	Complete Set of Grates
1425	Abate	Alliance	Unabated
425	Ambush	Anvil	Unambushed
1525	Azure	Arctic	Unazured
525	Archive	Anchor	Unarchived
1625	Abdicate	Antarctic	Unabdicated
625	Atlas	Applause	Unatlased
1725	Abduct	Album	Unabducted
725	Alcove	Attic	Unalcoved
1825	Abet	Antler	Unabetted
825	Abandon	Area	Unabandoned

37 SERIES

1537	Cursory	Curtain	Uncursed
537	Caliper	Cypress	Uncalipered
1637	Camera	Cactus	Uncamed
637	Cycloid	Cabbage	Uncycloided
1737	Camphor	Culvert	Uncamphored
737	Caller	Cabinet	Uncalled
1837	Curvity	Cadet	Uncurvited
837	Cuttle	Cynic	Uncuttled
1937	Candid	Calendar	Uncalendared
937	Camber	Caboose	Uncambered
2037	Canine	Calico	Uncanined
1037	Cutlass	Cackle	Uncutlassed

48 SERIES

1748	Layman	Lancer	Unlanced
748	Lariat	Laborer	Unlariated
1848	Leader	Language	Unleadered
848	Lasso	Lackey	Unlassoed
1948	Lecture	Lantern	Unlectured
948	Latent	Lagoon	Unlatented
2048	Legacy	Lanyard	Unlegated
1048	Lather	Ladder	Unlathered
2148	Legend	Lapel	Unlegended
1148	Laurel	Lambkin	Unlaureled
2248	Luminous	Lupine	Unluminated
1248	Lymph	Lyric	Unlymphed
2348	Lucrative	Lullaby	Unlucrative
1348	Lutarius	Luxury	Unlutarated

IMPROVED CAPITOL SOLAR BOILERS

No.	Steam	Water	Complete Set of Grates
702	Wabble	Warrior	Dewabbling
1002	Wadding	Washboard	Dewadded
1003	Wafer	Wassail	Dewafering
1004	Waggish	Watchman	Dewagging
1402	Wakeful	Waveless	Dewaking
1403	Wallet	Wayfarer	Dewalling
1404	Wallflower	Waylay	Dewaylaying
1803	Whiplash	Weariness	Dewhipping
1804	Walnut	Wedlock	Dewalnutting
1805	Walrus	Weevil	Deweeviling
2403	Wampum	Weightless	Dewamping
2404	Warden	Welfare	Dewarding
2405	Wardrobe	Welter	Deweltering
3303	Warfare	Wetness	Dewarfaring
3304	Warily	Whalebone	Dewariling
3305	Warrant	Whetstone	Dewarranting

FURMAN SECTIONAL BOILERS

Size	Steam	Water	Complete Set of Grates
184	Yarn	Packet	Gyrated
185	Yawl	Paddle	Gyration
186	Year	Painter	Gyratory
187	Yell	Parent	Gyromancy
225	Yean	Zed	Gencive
226	Yearling	Zenana	Genope
227	Yeast	Zest	Gerboise
228	Yelk	Zetic	Gerant
276	Yelp	Zeugma	Gite
277	Yerk	Zimone	Giron
278	Yew	Zoogeny	Grafter
279	Yelder	Zoolite	Gisant
337	Younker	Zoopher	Guipon
338	Yucca	Zotoma	Gunstaf
339	Yule	Zygoma	Gymnote
340	Yulger	Zymic	Gulot
387	Yardarm	Zonner	Glossiness
388	Yawning	Zoccolo	Glottal
389	Yernut	Zinkenite	Glover
390	Yieldance	Zechstein	Glucose
391	Youngster	Zealless	Glycerin

FURMAN ROUND SECTIONAL BOILERS

Size	Steam	Water	Complete Set of Grates
16–0	Slush	Crane	Glair
16–1	Ice	Lark	Glade
16–2	Fog	Bobolink	Guzzle
19–0	Dry	Dove	Glassy
19–1	Snow	Sparrow	Gurgle
19–2	Rain	Robin	Gusset
22–0	Damp	Thrush	Gust
22–1	Hail	Canary	Guttural
22–2	Frost	Wren	Gutter
22–3	Foiling	Waspish	Gimbal
25–0	Wet	Oriole	Gypsy
25–1	Dew	Grouse	Gynarchy
25–2	Mist	Quail	Gymnast
25–3	Cloudy	Squab	Gypsum
29–0	Flood	Pelican	Gleaner
29–1	Sleet	Peacock	Gleaming
29–2	Storm	Parrot	Glee
29–3	Blizzard	Eagle	Gluten

SUNRAY BOILERS

Size	Steam	Water	Complete Set of Grates
54–E	Byzant	Banjo	Jabberer
55–E	Byssus	Barren	Jabiru
56–E	Byword	Basin	Jacamar
57–E	Banish	Bass	Jacent
95–A	Beginner	Bazar	Jacknapes
96–A	Begone	Battlement	Jackdaw
97–A	Behave	Basify	Jackplane
98–A	Beheld	Beg	Jacobin
326	Buttress	Beacon	Jackonet
327	Butternut	Bead	Jaculate
328	Bechic	Bearlike	Jadery
329	Becomes	Beleaguer	Jaggery
WN 276	Bee	Beast	Jailbird
WN 277	Bedouin	Beating	Jalapin
WN 278	Beefy	Because	Jambee
WN 279	Beeves	Believer	Japhetic
WN 280	Beetling	Beclip	Janizary
WN 281	Belgian	Becurl	Japanese

SUN GAS WATER HEATERS

No.	Code	Complete Set of Grates
3	Inwrap	Sarcoline
4	Inwove	Sardine
5	Involve	Sarsaparilla
6	Invocate	Sashoon
7	Invite	Satanic
8	Investive	Satchel
9	Inversion	Satellite
10	Inveigler	Satiric

TANK HEATERS, ETC.

No.	Steam	Water	Complete Set of Grates
2 X	Laundry stove	Ivory	Saloon
33	Laundry stove	Issue	Samphire

SUNRAY TANK HEATERS

No.	Code	Complete Set of Grates
15	Isonomy	Sanction
16	Isolate	Sanctuary
17	Islander	Sandbag
19	Isagon	Sandstone
60	Iselope	Salify
61	Islet	Salam
62	Iterate	Salutary
63	Itching	Salute
64	Italian	Samaritan
65	Isthmus	Sambo
67	Irrigation	Sanicle
68	Irreverence	Sanscrit
69	Irresponsible	Santalin
72	Irresolute	Sapient
73	Irregular	Sapota
74	Ironical	Sarcasm

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